CHOLERA IN SOUTHERN INDIA.

A RECORD

OF

THE PROGRESS OF CHOLERA IN 1870,

AND

RÉSUMÉ OF THE RECORDS OF FORMER EPIDEMIC INVASIONS OF THE MADRAS PRESIDENCY.

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INTRODUCTORY REMARKS.

A retrospective survey of the movement of cholera in former epidemics essential to a comprehension of the phenomena of invasion of Southern India.

1. Having been charged by the Government of Madras with the duty of investigating certain points connected with the progress of cholera in Southern India, it has seemed to me desirable, before going on to describe the main facts brought to light during 1870, and the relation of the cholera of the past year with that of the years immediately preceding, to take a survey of the cholera history of former years, as affecting the southern portion of the Indian Peninsula.

Until quite recently our notions in regard to the causes influencing the movements, and the effects of season or climate in the development of, cholera have been extremely vague and unsatisfactory. During the last sixty years many theories have been propounded to account for the phenomena of cholera epidemics, and even in the present day so unsettled are the views of the profession that the old battle between the "contagionists" and "non-contagionists" bids fair to be fought over again with all its original fierceness.

One of the most painstaking and intelligent investigators of modern times, Dr. Bryden, has recently given in his adhesion to the doctrine, that cholera movement is due in the main to meteorological influences, and that human intercourse plays but a very secondary part in the distribution of the pestilence. While views of this nature are declared to be formed on the basis of statistical data, and while directly contrary theories, the result of experience and induction, are supported by the great bulk of the profession, both in and out of India, it behoves the investigator to proceed with caution, and to weigh carefully every real or assumed fact, before he permits himself to draw inferences therefrom.

The record of the cholera invasion of 1818.

2. In this view of the case it has seemed to me to be absolutely necessary to re-examine some of the older data available in regard to the prevalence of cholera in Southern India. The details of the epidemic of cholera in the year 1818 were recorded with the most scrupulous care by the late Mr. W. Scott, Secretary to the Medical Board, whose report was published in the year 1822, but has long since been out of print. The many cholera invasions which have affected this Presidency from 1818 down to 1859, I have not at present the leisure to investigate, and I am not sure that the whole of the data are available for the production of a true narrative of each epidemic invasion. I have chosen, however, the period commencing with 1859, partly because it was a year of new invasion of Southern India, (and it was necessary to follow out the history of a new cholera from its first appearance in the south to its final decay or replacement by a new invasion,) and partly because from my late official position as Secretary to the Inspector-General, Indian

Investigation of the movement of cholera in Southern India since 1859.

Medical Department, I have had a personal acquaintance with the main facts of every cholera epidemic in Southern India from that date down to the present time. From the year 1859 down to 1865, I have had to trust chiefly to the Medical returns and reports of the Army, Jails, and Civil Dispensaries for the evidence of the presence or absence of cholera in any locality, but from 1866 down to the present time the death registers of the whole population of twenty-six millions have been available for the purpose of this inquiry.

Epidemic cholera does not arise spontaneously in Southern India.

3. From all that I can ascertain malignant or epidemic cholera is not a natural product of Southern India. It is quite true that the very earliest records we have of the disease describe it as occasionally prevailing in Malabar, Arcot, Bellary, and on the Coromandel Coast, and there can be no doubt that the whole of the peninsula, in times past, was subjected to invasions of cholera from the north, as in the year 1818, the invasion of which year is so graphically described by Scott, and in the more recent invasions to be presently recorded. But the fact of a disease being met with commonly in a locality is no proof that it is of endemic origin. When we come to examine into the life-history of cholera, as Dr. Bryden has done, we shall find that no conditions of soil or climate in this part of India are capable of perpetually renewing, what for want of a better term I shall designate, the contagium of the disease, and that, except in very rare instances, an invading cholera never survives beyond four years, and in most instances is extinct in a much briefer period. In this respect cholera follows precisely the same law as small-pox, and possibly also some other epidemic diseases.

Phenomena common to cholera and other epidemic diseases.

It chooses by preference to occupy new ground, that is, it finds the fittest conditions for its growth among populations that have not recently been ravaged by cholera. It is affected more or less by seasonal changes during the natural course of its life; active and deadly in its destructive powers at one period of the year under peculiar meteorological or climatic conditions, and dormant or inoperative at other periods, when a different order of meteorological phenomena prevails. Like small-pox, too, after a season of unusual and wide-spread devastation, it dies away completely, and is not renewed until a further invasion from without occurs.

Tendency of cholera to become extinct in Southern India, defeated by periodical new invasions from Lower Bengal.

4. But although the evidence, as to the endemic character of a cholera capable of epidemic development, in Southern India, is very weak and dubious, there can be no doubt that some localities do harbour and reproduce the contagium for a longer period than others. There are certain districts in the Madras Presidency in which a reproduction of an invading cholera will go on for three, or even four, years, after the primary invasion, and there are other places in which the reproduction either does not occur at all, or lasts for one season only, leaving a long interval of two or three years of complete rest between one invasion and the next following it.

In the districts in which cholera lingers for three or four years after the invasion, we have been in the habit of supposing that the disease was a true endemic of the soil; but, although the conditions of soil and climate in such districts do probably approach very nearly to the conditions of the natural habitat of cholera in Lower Bengal, yet there are probably some points of difference as yet unascertained. The history of the latter months of 1858 and 1868 show most

undoubtedly that cholera had become in those years completely extinct over very large tracts of Southern India, and was renewed only by a distinct new invasion of cholera contagium from the true endemic province in Lower Bengal.

Physical conditions of districts in which cholera lingers, similar to those of the true endemic province.

5. There are in the south of India certain localities which, as before observed, do undoubtedly tend to harbour cholera, and the physical conditions of such districts in some respects resemble those of the Gangetic delta. Thus the delta of the Cauvery river is proved to be a favourite haunt of cholera, and in this district we find a deep alluvial subsoil, permeable by water at all seasons of the year, and often for months together completely saturated by irrigation from innumerable streams. As the river channels cease their supply, the water recedes from the surface and falls to a lower level in the subsoil, which soil is subjected to a process of desiccation in its upper strata. It is usually during the earlier period of this drying up of the land that the seasonal reproduction of cholera in Tanjore and Trichinopoly is most active, and it is under precisely similar conditions that cholera re-appears year after year in the endemic province of Lower Bengal. But the cholera thus bred or fostered in the localities of Southern India, hitherto regarded as endemic centres, never diffuses itself widely. If left to itself, it would soon die out. It is the importation of new seed, so to speak, into these localities that gives strength to the cholera and causes them to be reputed as cholera centres. For all practical purposes localities like the districts of Tanjore, Trichinopoly, and the valley in which the town of Salem stands, may be considered places in which cholera re-appears year after year, though for scientific accuracy, it would hardly be fair to speak of them as endemic sites. Cholera is like a foreign plant in them, that has found a fairly congenial, but not a wholly natural soil, so that after a certain definite time the plant dies, and has to be replaced by fresh seed brought from a foreign locality. Although the soil conditions of our southern river deltas are very similar to those of Lower Bengal, the climatic conditions as regards rain-fall and humidity are very different. The climate of the southern delta districts is hot and dry with but little variation in temperature, while that of Lower Bengal is especially remarkable for a combination of heat and moisture and a wider thermometrical range.

The movement of cholera is 1818, repeated more or less completely in all subsequent invasions.

6. The history of the epidemic advance of cholera in 1818, as detailed in Scott's narrative, is, in point of fact, the history for all time of the mode in which the peninsula and Southern India are invaded. In every new invasion there are sure to be some minor differences, as to the rapidity of movement of, and the extent of country covered by, cholera, but the main facts are unalterable. The broad truth in regard to invasion to be borne in view is, that the great body of cholera which invades Southern India leaves its natural territory in Lower Bengal, by what Bryden terms "the southern epidemic highway" across the Central Provinces, and southward through the Deccan and Bombay Presidencies towards Madras territory, which in a longer or shorter space of time is occupied. Nor does cholera terminate with the extreme southern limit of the peninsula. In all true epidemic invasions, from 1818 down to 1870, it has been carried on to the neighbouring Island of Ceylon. In this southern progress of cholera, a period of two years may elapse (as in the latest invasion) before the epidemic has travelled its southern course from Bengal to Ceylon, or, as in 1818, the whole journey may be completed

Period of time occupied in the movement of cholera from Bengal to Ceylon.

in six or seven months. The epidemic of cholera that left Bengal in the spring of 1818 reached Ceylon in January 1819; but, with all the facilities for rapid communication introduced during the last half century, we find that the great body of moving cholera in the last epidemic invasion, which fell upon the Central Provinces in the spring of 1868, did not reach Ceylon until May 1870. A proper appreciation of this fact will, I think, indicate that in the movement of cholera from its endemic home, there are other agents than human intercourse at work. An attempt will be made by and bye to estimate, in their order of relative importance, the various factors concerned in the progressive movements of epidemic cholera. It will be only necessary in this place to recognize the fact that cholera does move in accordance with its own laws, and that a new epidemic movement in the Bengal Provinces is (so far as the facts of the past admit of an opinion being formed) sure to be felt, at a date more or less remote, not only in the tract of country to the north-west of Bengal, but also to the extreme south-east of Asia, including Burmah, the Straits Settlements, and China, and to the extreme south of the Madras Presidency, not excepting the Island of Ceylon.

Cholera does not move into the Madras territory by the shortest route.

7. There is one other point to be noticed here in regard to the movement of cholera out of the endemic provinces, and it is, that an epidemic does not usually take the shortest route, but, as it so happens, the route of greatest population and traffic. A map of India shows that the actual distance between Calcutta (the centre of the endemic field) and Madras is the shortest along the Coromandel Coast; but there is only one instance recorded in which cholera has advanced epidemically along the coast line down to Vizagapatam, and that was in the year 1818, where, according to Scott's narrative, it travelled in this direction as well as through the Central Provinces and Hyderabad. The evidence adduced by Scott does not make it quite clear to me that cholera actually took this coast route, but it is possible that movement did occur in this direction, as well as by the more common route through the Central Provinces. In the two invasions of 1859 and 1864 it is abundantly clear that cholera did not advance along the Coromandel Coast line from north to south, but that the districts on the coast, from Vizagapatam downwards, were invaded subsequent to the overflow of the cholera wave in Nagpore and the Deccan.

The ordinary course of the cholera that finds its way into the Southern Presidency is at first north-west through Chota Nagpore and Allahabad, then west and south through the Central Provinces to Bombay and the Deccan. The readiest way for cholera to reach the Vizagapatam, Godavery, and Kistna Districts, when an epidemic wave starts out of the endemic field, would be through the districts which lie immediately to the north of Cuttack and Ganjam, but it chooses, by preference, the long and circuitous route just indicated. What the actual explanation of this movement may be is not now the question. It is sufficient for the present that I draw attention to the fact.

Influence of mountain barriers in directing the movement of cholera.

8. In studying the movements of cholera I think one cannot help being struck by the circumstance that a mountain barrier frequently appears to offer an insurmountable resistance to the progress of an epidemic.

The great Himalayan Range, running in a north-westerly direction across the Asian continent, appears to be practically effective in limiting the march of

cholera to districts beyond, and we notice the same thing in regard to the great mountain chain of the Western Ghauts, a range of but moderate elevation, that a cholera on one side has great difficulty in getting over to the other. During the latest invasion in 1869 we have had the spectacle of a cholera moving down to the extreme south of India on the eastern side of the ghauts, while the tract on the western side was unaffected. Having travelled down to Cape Comorin, cholera turned round the mountain barrier, and began a northerly progress *up* the Western Coast in 1870. We may remark too, how, in the invasion of the Kurnool District in 1869, cholera never passed the hilly tracts of the Eastern Ghauts which divide the Cumbum Talook from the other parts of the district. I shall have occasion to refer hereafter to a phenomenon which Dr. Bryden has pointedly alluded to, viz., that cholera is often manifested in extreme virulence along the bases of these natural barriers, and in the river basins and ravines that lie in between great mountains. Whatever may be the explanation, I believe there is no doubt whatever of the fact, that cholera getting into such localities is particularly virulent and prolonged in its visitations.

The reluctance of cholera to overstep a mountain barrier, and especially when that barrier is a wild tract, the people of which hold little or no communication with those of the plains, is doubtless the reason why Vizagapatam is not directly invaded from the adjoining districts of Ganjam and Cuttack, where, along the coast line, cholera is a true endemic. The hill tracts of Orissa, Goomsoor, and Jeypoor offer obstacles to the direct southern progress of cholera except on the narrow strip of coast line, where it is opposed by the winds from the Indian Ocean —winds, which along the Coromandel Coast, are nearly always effectual in repressing cholera, even where epidemic invasion or reproduction is in progress.

The invasions of 1818, 1859, 1864, and 1869 compared.

9. With these observations I may now reproduce the official narrative of the 1818 epidemic invasion of Southern India, and describe the history of three modern invasions, occurring respectively in 1859, 1864, and 1869. The two latter of these correspond with Bryden's years 1863 and 1868, but the 1859 invasion, so far as Southern India is concerned, has not been recognized by that author.

CHAPTER II.

THE CHOLERA INVASIONS OF 1818, 1859, AND 1864.

Mr. Scott's narrative of the cholera invasion of 1818.

"The history of the origin and progress of cholera in the establishments of Bengal and Bombay has already been given to the public in the reports of the Medical authorities of those Presidencies. During the period between the months of May and September 1817, it appears to have, for some time, prevailed in the districts of Mymensing, Behar, Nuddea, Jessore, Calcutta, Rajshaye; and, shortly afterwards, to have reached Balasore and Cuttack. In November it prevailed at Mirzapore, Rewa, Sheergur, and other northern parts of Bundelcund. Jubbulpore, Saugor, Ougein, and Nagpoor were under its influence before the end of May 1818. It reached Jaulnah, Aurungabad, and Ahmednuggur early in July. During that month it extended to Seroor and Poona, and to the Presidency of Bombay about the middle of August. In the following historical sketch, the dates and local progress of the disease in the territories of Madras have been determined with due attention to the authority of the reports consulted; and for the convenience of geographical reference, it has been successively traced along the eastern, middle, and western districts, from the northern to the southern extremity of what is called the peninsula.

In these territories it first appeared in the district of Ganjam. The Magistrate of that place, in a letter dated 20th of March 1818, states that the inhabitants had suffered severely from fever and cholera. It does not appear, however, that the cholera was at all very prevalent in most parts of that district.* It was pretty frequent at Aska from the 23rd of April until the 16th of May. At the latter period it suddenly disappeared; but it again manifested itself in the beginning of July, and during the month prevailed more generally than it had formerly done. After November few cases were observed in the Ganjam District, although the disease was then, and for a year afterwards, general in the contiguous district of Vizagapatam. Fever prevailed in several parts of the former district until March 1819. At Berhampore cholera was pretty frequent in September and October 1820.

Ganjam.

* NOTE.—Ganjam is within the endemic area, and it is not quite settled by Scott's narrative that cholera did travel out through this district to the places to the south on the Coramandel Coast.-(W.R.C.)

No authentic information regarding the course of the disease at Chicacole has been obtained; but it is known, that this place was not exempted from its destructive influence

Chicacole.

No well-marked case occurred at Vizianagrum until the 20th of May;† and then, the cases which did occur continued to be slight until the 26th. From this time until the 5th of July the disease continued to prevail generally. For a month after its commencement, though formidable in appearance, being attended by violent spasms of the whole body, it almost always yielded to the timely application of the appropriate remedies. But during the remaining fortnight although, at first much less alarming and without evident spasms, it frequently resisted every mode of treatment, applied even in the early stage. After the 5th of July only a few slight cases occurred.

Vizagapatam District, Vizianagrum.

† NOTE.—The early date of the appearance of cholera in the Vizagapatam District is the chief reason for supposing that cholera on this occasion took the unusual course of moving southwarda long the sea-board.—(W. R. C.)

At Vizagapatam it appeared about the 15th of May. The weather is said to have been then oppressively hot, and the air loaded with humidity. It would seem that few Europeans were attacked after June; but the disease, differing occasionally in its prevalence and in the severity of the symptoms, continued to be general in Vizagapatam and the neighbouring country until February 1820. It had somewhat declined in December 1818, but became again very prevalent in March. In May 1819 a greater number of cases were exhibited than in any other month; but the greatest proportional mortality occurred in April and November of that year.

Vizagapatam.

It showed itself in Rajahmundry about the 10th of July; began to decline about the beginning of August; and disappeared early in November. It re-appeared at this place on the 25th of January 1819, while an uncommonly cold wind was blowing from the south-east; and it continued to prevail until the end of April.

Godavery District, Rajahmundry.

It commenced its attack at Ellore about the 5th of July, both on the 1st Regiment of Native Cavalry stationed there and the Native inhabitants. It was remarked that the Mussulman families were the greatest sufferers, although the population consisted principally of Hindoos. The greater mortality among the former was ascribed to their obstinacy in refusing proper medical assistance.

Ellore.

At Masulipatam cases first occurred about the 10th of July. The convicts confined in the Fort were the subjects of these cases. And, indeed, the disease for some time appeared only in one bomb-proof apartment. This one was low, damp, ill-ventilated, and very crowded; but, although these disadvantages were in some measure remedied, it continued to produce a greater number of cases than the other two, which were commodious and comfortable. The disease commenced in the town and neighbourhood about the 20th of July; was very prevalent during August; declined rapidly in September; and disappeared early in October, while the weather was chilly and the rains heaviest. It was nearly confined to the lower classes of the people. It re-appeared at this place about the 15th of June 1819 during extremely hot weather. This attack, however, was not so violent, nor of so long continuance as the former.

Kistna District, Masulipatam.

In the several villages situated along the southern bank of the Kistnah river, from the eastern extremity of the Zillah of Guntoor to the western extremity of the district of Palnaud, it seems that it appeared nearly simultaneously about the end of July; that it gradually extended southwards; and that about the middle of November 1818 it quitted that part of the country. It commenced about the beginning of the westerly rains, and continued until the termination of the rainy season. It is reported to have been more fatal during the prevalence of bleak westerly winds than at other times; and in the villages situated in the vicinity of tanks than at other places. The Banians or merchants

of the town of Guntoor, who occupy the only wide and dry street in it, almost entirely escaped the disease; while the Brahmins, who inhabit a close and damp street, suffered in as great a proportion as any other class of the people.

Guntoor.

In the most northerly villages of the Zillah of Nellore this disease began to prevail on the 2nd of August; and before the 5th of October it had reached the most southern part of it, having in its course appeared at the town of Ongole on the 14th of August, and at the town of Nellore on the 20th of September. The Zillah extends about 180 miles from north to south, and varies between forty and sixty miles from east to west. In twelve days it travelled thirty-two miles, in the next twenty-seven, eighty more; and in two months from its commencement it spread over the whole Zillah, except the two south-west divisions of it, which altogether escaped this visitation. These are the most elevated parts of the Zillah; they are populous and much frequented by merchants. The disease indeed was less fatal than in the other parts in the whole western frontier, which is near the hills; and in some of the villages there situated, it did not at this time appear. There had been no sensible change in the atmosphere previously to its approach, nor was its progress at all affected by the occurrence of the rains. It continued during the rainy season; and, disappearing in the order in which it had commenced, it entirely quitted the Zillah before the 15th January 1819; it again became general in the northern parts of the Zillah about the middle of April 1819, and continued to travel in a southerly direction, at nearly the same rate as formerly, having reached Ongole on the 16th of May and Nellore on the 3rd of July. In the Ongole District it disappeared before the end of August, and in that of Nellore before the end of September. The period of its continuance in any large town or tract of country of these districts scarcely ever exceeded three months. At this time it was more prevalent and much more fatal than last year; and it was especially violent at those places which then enjoyed an immunity. The weather was mild and temperate during the whole period of this second attack. There were occasional falls of rain, but no change in the sensible properties of the atmosphere seemed to affect the course of the disease.

Nellore District.

At Madras the first case seen by a Medical Officer occurred on the 8th of October; but, from the accounts of natives, it then appeared that some cases had occurred so early as the 5th of that month. It continued to prevail pretty generally in Madras and in the adjacent villages until the 24th, when it received a temporary check from a violent storm that happened on that day. It very soon, however, increased again, and prevailed with a considerable, though variable degree of violence until the beginning of November. It then began to decline slowly; and sometime afterwards it became milder and of rare occurrence. The poorer classes suffered more from its ravages than those in better circumstances. A detailed account of the state of the weather, during the prevalence, will be found in the meteorological tables. On the 5th the wind was southeasterly, the weather cloudy and wet, and there was much thunder. On the 7th the wind became north-westerly, and it continued in this direction until the 12th; from the 12th to the 15th it was variable. The weather was cloudy, and much rain fell from the 5th to the 15th; from the 15th to the 23rd the wind was with little variation south-easterly, and the weather generally pretty clear. The north-easterly wind commenced on the 23rd, and the violent storm, already noticed, occurred on the 24th. The weather, though variable, was pretty frequently clear after this period. In April 1819 the troops at the Presidency were entirely free of the disease, but it re-appeared early in May; and, although it did not afterwards become general, it has continued to show itself occasionally since that period. Its attacks were most frequent during the hot months of 1819 and 1820; in 1821 they have been of more rare occurrence.

Madras.

It appeared at Poonamallee on the 13th of October; and without having become very prevalent seems to have disappeared about the middle of the following month. From the 8th to the 21st of July 1819 many cases again occurred at this place.

Poonamallee.

At St. Thomas' Mount also it appeared on the 13th of October; but, although not very violent or general it continued long at this station. It declined considerably in December, and continued to decrease until May 1819. It again increased in May; and, during the three subsequent months, was more prevalent than at any preceding period of its course. It declined in September, and early in 1820 became of rare occurrence.

St. Thomas' Mount.

It first showed itself at Wallajahbad about the middle of October, and continued to prevail with different degrees of violence in H. M.'s 86th Regiment and among the Native inhabitants during November and December. Several cases occurred there about the end of April, and a few in the beginning of May 1819: it became prevalent towards the end of June of that year, especially in H. M.'s Royal Scots; declined about the 8th of July, and soon afterwards disappeared.

Wallajahbad.

The cholera continued its progresssive course along the coast; but we have no accurate accounts of the dates of its appearance or decline at Sadras or Pondicherry. It first manifested itself at Cuddalore about the 14th of November after the commencement of the heavy rains, and continued to prevail with considerable violence till the end of December. At this time it declined rapidly and soon afterwards disappeared.

Cuddalore.

At Combaconum it appeared about the 20th of November, declined about the middle of December, and soon afterwards terminated; about the middle of January it was for two or three days nearly as prevalent as it had formerly been.

Combaconum.

It began to prevail at Nagore about the 10th of November, principally among the caste of Natives whose occupations obliged them to expose themselves much to the weather, which was then damp and rainy.

Nagore.

Negapatam, although distant from Nagore only four miles, continued entirely free of the disease until the 22nd of November. It was much on the decline at both places before the 20th of December. As at Combaconum it was again very prevalent at these places for two or three days about the middle of January. It re-appeared at both towns about the end of July 1819, and continued prevalent until the middle of August. At Nagore it again showed itself about the end of October, and prevailed until the middle of the following month; and at Negapatam several cases occurred from the 1st to the 13th of February 1820.

Negapatam.

Having thus traced the progress of this disease along the Eastern Coast as far as it might be supposed to be connected with its first appearance at Ganjam, it will now be necessary to give some account of its course along the inland stations occupied by troops of this Presidency. Here also we shall begin with the most northerly of these, which was likewise the first that became subjected to its influence.

It began to prevail among the inhabitants of Nagpore and the neighbouring villages about the middle of May 1818; but, although generally diffused and productive of great mortality among the citizens, with whom our Native Soldiery had frequent and intimate intercourse, no case of it appeared in the troops until the 26th or 27th of May. At this time three or four men of the Depôt Corps were attacked and died. On the 30th of May a large detachment of Bengal and Madras troops arrived at Nagpore from the siege of Chandah, and took possession of the huts near the Seetabuldee hills, which they had formerly occupied. Notwithstanding the excessive heat of the weather and the laborious duties of the siege, they had hitherto been tolerably healthy, and no one had suffered an attack of the cholera. Scarcely, however, had they taken possession of their quarters, when it appeared in a very violent form among the Bengal troops and their followers.

Nagpore, Central Provinces.

Of the Madras troops only one individual was this day attacked. On the 31st, however, it attacked them and their followers in a very violent manner, the majority of those this day attacked having died. On the 1st of June the attacks were very numerous, but the deaths were proportionately much fewer. From the 2nd it began to decline rapidly; and after the 10th rarely occurred. For some days it was confined to the troops who had returned from the campaign; and when it did appear in those who had not left Nagpore, it was comparatively mild and partial. The European part of the troops suffered but little. A few of the Madras Artillerymen were attacked, but they all recovered. Three or four men of the Bengal Artillery fell victims to it. In a detachment of the force recently employed at Chandah, which was left at Hingunghat, 50 miles south of Nagpore, it appeared at the same time and followed the same course, as it did in the main body of the force at the latter place.

At Jaulnah cases were first observed on the 3rd of July among the families of our Native Soldiery in the village. On the following day it attacked the troops, both European and Native, and from this time until the 11th it continued very prevalent and violent. After the latter period the attacks were milder and less frequent. Several facts connected with the origin and progress of the disease at this place having been adduced in proof of its contagious nature, it may be deemed necessary here to notice them. Since the middle of June, when several heavy showers of rain had fallen, the weather had been cool and pleasant, the thermometer ranging from 80° to 86°, seldom varying more than 4° in twenty-four hours. The atmosphere was generally cloudy, *and the wind blew steadily from the south-west.* This kind of weather continued during the prevalence of the disease. A detachment, which had left Nagpore while the disease was prevailing at that place, and of which men suffered an attack of it in the march, arrived at Jaulnah towards the end of June. On the 3rd of July the cholera, as has been seen, appeared at

Jaulnah.

the latter place. The Russel Brigade arrived at Jaulnah on the 4th, and left it for Hyderabad on the 5th of July without any case of the disease having appeared among them, but a few days afterwards it attacked them and produced great mortality. A party of gentlemen with about 1,000 followers arrived at Jaulnah on the 4th, and left it in good health on the 6th. Before they arrived at Arungabad, however, many of their followers were attacked by the cholera, and it began to prevail at that place soon after their arrival. The disease was most prevalent in the vicinity of the place where the first case occurred. H. M.'s Royal Scots, who were stationed immediately in the front of the general market place, in which the disease raged, and with which they had constant communication, suffered much by it, while the Horse Artillerymen, who were a considerable way in front, and had less direct communication with the market place, and but little intercourse with the Royals, suffered comparatively very little. This fact, however, has been ascribed to another cause. The Artillery men lived in tents, and the Royals in old and uncomfortable barracks. The latter were removed into their tents, and the cases, the day on which this removal was effected, were only one-third of the number that had occurred on the preceding day. The disease continued to decline after this period. When it appeared in a family, several individuals of that family generally suffered an attack. An endeavour will be made, in the proper place, to appreciate these arguments.

Nusseerabad.

It appeared on the 14th of July in Lieutenant-Colonel Heath's detachment encamped in the neighbourhood of Nusseerabad, south of the Taptee river, and among the inhabitants of the surrounding country.

Malligaum.

In Lieutenant-Colonel MacDowall's Camp near Malligaum in Kandeish it appeared among the camp-followers on the 13th of July. It attacked some men of the Madras European Regiment on the 16th, and from this day until the 23rd the cases in that Corps were numerous and very violent. After the latter period the severity and frequency of the attacks were diminished. Several violent cases, however, occurred during August. A considerable number of people, who had left Jaulnah during the prevalence of the disease, and some of whom were attacked on the way, arrived in the camp before any case had occurred in it. The 17th Regiment of Native Infantry, which composed part of this force, and its followers entirely escaped the disease. Over the ground of its encampment, which was situated between two hills, a strong current of air is said to have then constantly blown. The European Regiment was encamped on lower and more confined ground, and when the cholera declined, a malignant bilious remittent fever became very prevalent in the Corps.

Nusseerabad is about eighty miles N. N. W. from Jaulnah, measuring in a straight line on the map, and Malligaum is about 100 miles from it in a W. N. W. direction. We have seen that the epidemic appeared at both these places in ten or eleven days from the date of its appearance at Jaulnah. These detachments had direct communication with the force at Jaulnah, *and they present almost the only exceptions to the uniform progress of cholera in a southerly course on this side of India.* In Sir John Malcolm's Camp at Mhow cholera is incidentally noticed as having attacked part of the force on the 16th of July ; but it would seem from the Bengal Report to have first appeared there in the course of the month of May, its progress being from east to west. Mhow is situated near Indore, north of the Nerbudda, and is about 120 miles N. by W. from Nusseerabad ; the force was composed of the troops of different Presidencies. It was independent of that of Jaulnah, and there is no particular report in this office of the manner in which cholera made its appearance there ; we may conclude, however, that the attack on the 16th of July was unconnected with the appearance of the disease at places to the southward of the river Taptee.

Punderpoor.

It began to prevail at Punderpoor on the 14th of July, while crowded by strangers congregated for the celebration of a great festival. Here, as at other places in similar circumstances, the mortality it produced was very great. It commenced its attack on the troops in the vicinity on the 17th, and declined about the 24th of the month.

Hoobly.

In the force encamped near Hoobly in the Dooab, the first case of this epidemic occurred on the 13th of August 1818. For some days afterwards it was very partial and confined to the camp followers. It seems to have appeared at Badamee and Dharwar nearly at the same time as at the head-quarters of the force. It continued to exist in the force till about the end of September; but was most prevalent from the 18th of August till the 1st of September : *when it appeared a strong wind prevailed from the south-west with heavy clouds and rain.** Neither Hoobly nor any of its adjacent villages had at this time become affected, nor had

* I have italicised a few passages relating to the southern progress of this invading cholera against the south-west monsoon. I would refer the reader to the Scott's Map upon which I have indicated by arrows the course of the monsoon winds, to satisfy himself that the recently propounded theory that cholera cannot advance against a monsoon wind, is quite opposed to what atucally occurred in 1818.—W. R. C.

any person arrived in camp from the country north of the river Kistna in which cholera was then prevailing. This force again experienced a pretty severe attack of it about the middle of April 1819 when encamped in the neighbourhood of Gudduck. At the commencement of this attack a strong easterly wind prevailed, but in a few days the wind changed to the west. After this period the disease declined, the cases being fewer and milder than during the preceding days.

Bellary.

At Bellary it manifested itself on the 8th of September 1818; but until the 17th was partial and confined to the native inhabitants. From this time until the end of the month its attacks were pretty frequent in the troops both European and Native. It declined about the beginning of October, and disappeared from the European troops on the 5th of that month. About the 20th October it again attacked, with its former violence, the troops and inhabitants, especially the lower fort where it was more prevalent than in any place without in the immediate neighbourhood : and it did not disappear till towards the end of November. The greater prevalence in the lower fort has been ascribed to its confined and crowded state ; the barracks of the soldiery being surrounded by the huts and houses of the natives. Of five hundred prisoners in the public jail of Bellary only one was attacked, and he recovered. The jail is situated about twelve hundred yards eastward of the fort, and is surrounded with a high stone wall. H. M.'s 34th Regiment commenced its march from Bellary to Bangalore on the 17th of September, no well-marked case of cholera having then occurred in the Regiment. One man was attacked on the following day, but no case occurred on the 19th and 20th; twenty-eight men of the Corps were attacked on the 21st, twenty-four on the 22nd, twelve on the 23rd. From the 23rd the disease continued to decline rapidly, and after the 29th no case occurred. Of about 700 men ninety-one were attacked, and of this number thirty-seven died. The disease did not exist in any of the villages on the route when the Corps passed, but it soon afterwards appeared in all of them. Bellary suffered another attack of the disease about the beginning of May 1819.

Hurryhur.

It appeared at Hurryhur on the 12th of September, and continued to prevail in it and the neighbouring villages till about the end of the month.

Chittledroog.

At Chittledroog the first case was observed about the middle of September, but until the end of October only a very few slight cases had occurred. From the 1st to the 15th of November the attacks were pretty numerous and frequently of fatal termination. During the remainder of November a case occasionally presented itself.

Bangalore.

At Bangalore a few cases of the disease presented themselves towards the end of October and during November, but it did not at any time prevail generally at this station. H. M.'s 69th Regiment commenced its march from Bangalore to Cannanore on the 12th of October, no case of cholera having then occurred at the former place. On the 20th, while encamped in the vicinity of Madoor river, two men of a detachment of Native Soldiers accompanying the Regiment were attacked by cholera. No European, however, experienced an attack until the 24th. This disease was pretty frequent in the Corps from the 28th until the 13th of November.

The weather had been generally rainy since the commencement of the march, and when cholera appeared, the vicissitudes of the weather were sudden, and the camp was nightly deluged with rain. The Corps arrived at Cannanore on the 18th of November. From the 12th, when the march was commenced, until the 28th of October, dysentery was the most prevalent disease, but from the latter date until the 13th November cholera maintained the ascendency. After that period till the 24th of November dysentery was again predominant, but from the 24th until the 3rd of December intermittent fever, which had previously been rare, was the prevailing disease. No case of cholera had occurred during the last interval. The intermittent was of the quotidian type, only two cases of remittent occurred. After the 3rd of December dysentery regained the ascendency. Hepatitis also became more frequent.

Seringapatam.
Mysore.

At Seringapatam it appeared about the 6th of November 1818, and continued to prevail very generally about a month. It followed nearly the same course at the town, Mysore, and in the intervening and adjacent country. No authentic statement of the number of inhabitants who suffered from this disease has been received; but, if common reports are entitled to any credit, the mortality must have been much greater here than in any other part of the country. The people, it is said, convinced that the disease was a visitation of the displeasure of one of their gods, were more anxious to propitiate the offended Deity than to apply for medical aid, which was freely offered to them. They flocked to the temples of their gods, and deluged the altars with the blood of numberless goats, rams, and buffaloes, and, having offered the head of the victim, they generally retired to regale themselves with the consecrated carcass. It is said that, in many instances, having overcharged

their stomachs with this food, they, the same night, experienced a fatal attack of the disease. The performance of their superstitious rites subjected them to unusual fatigue, and exposed them to the vicissitudes of the climate at the season when these were most frequent and most violent. These causes, to which the extraordinary mortality has been ascribed, must have had considerable influence, but it would be interesting to investigate whether the climate of these places, which is notorious for fevers, might not have had some share in aggravating the calamity.

Manantoddy.

At Manantoddy in Wynaad about thirty cases occurred from the 16th to the 22nd October 1818. The weather during these days was cloudy, and a strong, eold easterly wind prevailed.

Coimbatore.

It commenced its course in the district of Coimbatore towards the end of November 1818, and soon became very prevalent and destruetive in the villages situated in the vicinity of the Cauvery river, particularly in Erode and Caroor. It reached Coimbatore on the 30th of November, it declined in December, and had almost disappeared by the end of January 1819.

Cholera attacked the Mysore Horse on the 8th of July while on the bank of the Godavery river, on the route to Hyderabad, and it continued to prevail in the Corps until towards the end of that month.

Hyderabad.

At Hyderabad it appeared towards the end of July, but it was not so prevalent nor so violent here as at the greater number of other stations. The cantonment enjoyed an immunity for many days after the disease had become prevalent at the Residency, a distance of about five miles, and those first attacked were soldiers who had returned from duty at the Residency.

It prevailed also several days in the market place, called *Begum Bazaar*, before it reached the eity of Hyderabad, although these plaees are separated only by a small river. Many cases occurred in the cantonment at different periods subsequently to this attack, but the disease did not afterwards become general. The eircumstances of one of these subsequent manifestations seem sufficiently interesting to require a more minute statement. A detachment of Europeans, in which cholera was prevalent, arrived at this plaee early in May 1819 and was encamped about two hundred yards in front of the quarters occupied by the Artillery. The disease did not at this time exist in the cantonments, but three or four days afterwards it appeared in the party of Artillery, five or six men of which soon suffered a severe, though not in any instance, a fatal attack. The wife of a Conductor of Artillery next became a subject of the disease, and a female friend who attended her for two hours was also attacked, and died next morning. The son of this woman, aged six years, suffered an attack the day after the death of his mother ; he recovered. One Assistant and two Sub-Assistant Surgeons, who had spent much time with the sick, were attacked, and one of the latter died. The disease soon appeared in the market places, in which it proved fatal to several Natives. Few cases occurred in the Native Corps stationed at this place, and H. M.'s 30th Regiment, which was in barracks about half a mile to the right, entirely escaped the disease. The detachment, which had marched from Madras, was attacked with cholera at the river Kistna, after exposure to a severe storm of wind and rain, and it continued to infest them on the route to Secunderabad. The villages on the road were, at this time, free of the disease ; but a Medical Officer, who travelled by the same road from the Kistna to Secunderabad about two weeks afterwards, found it prevailing in every village. The inhabitants asserted that it had commenced after the passage of the detachment, which, they believed, had communicated it to them.

Ghooty.

It first appeared at Ghooty on the 6th of October 1818, and cases occurred occasionally until the beginning of February 1819. It does not seem, however, to have been prevalent at that place. The 2nd Battalion 16th Regiment Native Infantry stationed at Ghooty, as well as the inhabitants of the place, experienced a very fatal attack of cholera in February 1820. It appeared on the 2nd of the month, immediately after the departure of the 1st Battalion 16th Regiment, in which it had proved very destructive during the march from Hyderabad, and in which it prevailed during a halt of three days at this place. It declined on the 20th, and was of rare occurrence after the end of the month. Early in March, however, it began to affect the inhabitants of the neighbouring villages. Of 101 cases among the men of the 2nd Battalion 16th Regiment admitted into Hospital during February, seventy-five terminated fatally. No case had occurred at this place during the six preceding months. It was observed that a great number of the attendants of the sick were attacked, and that generally when one case occurred in a family, several members of that family became subsequently, and often almost immediately, affected.

Cuddapah.

At Cuddapah it first manifested itself on the 9th of October, but it does not appear to have become general there.

Tripatty.

It appeared at Tripatty on the 1st of October during a festival, and it soon carried off a considerable number of victims.

Chittoor.

At Chittoor it showed itself early in October, and it was said to have prevailed for some time pretty generally in the district.

Vellore.

The first case of cholera observed at Vellore occurred on the 3rd October, but very few were affected before the 18th of that month. From the latter period till towards the end of December its attacks were pretty numerous. It does not, however appear to have been nearly so prevalent here as at the neighbouring stations of Chittoor and Arcot.

Arcot.

This epidemic appeared at Arcot about the 13th of October, and was generally prevalent until the 23rd. At this time it suffered a slight remission; for although it continued during the remainder of that month, and all the following month, the attacks were not so numerous nor so severe as during the preceding period of its course. It appeared on the day on which the wind changed from the south-west to the north-east or monsoon quarter.* The weather after this period was variable, the wind blew in sudden squalls, and torrents of rain fell. The sky was generally overcast, and although the thermometer did not fall lower than 74° at noon, a peculiar chilly sensation was felt. On the 22nd a strong gale of wind, accompanied with rain, blew from the south-west; and on the following day, as has been mentioned, the disease had considerably abated. This disease re-appeared at Arcot about the beginning of May 1819, and shortly afterwards at Vellore and Chittoor; but it does not seem to have been very prevalent. It left these places about the beginning of July.

* *Note.*—With reference to this statement I would merely refer to the fact that the Southward advance of the epidemic from Nagpore to this point occurred during the season of the South-west monsoon, *i.e.*, against the prevailing wind, and that the change of monsoon did not hurry the Southward advance. (W. R. C.)

Salem.

It seems to have entered the Barahmaul and Salem Districts from the north-west about the middle of November, and at an early period of its course to have carried off many of the inhabitants of the villages situated on the banks of the Cauvery. It showed itself at Sankerrydroog on the 19th of November, and began to decline about the beginning of December. On the 22nd of November it appeared at Salem. The weather for ten days preceding had been cold, cloudy, and rainy, and the wind was piercingly sharp. Here, as at other places, it first prevailed among the poorest and most destitute class of people. It continued very general until the 14th of December, but after that period it declined rapidly, and before the end of the month cases were of rare occurrence. Of the prisoners in the jail who were exempted from their usual labour and exposure during the prevalence of the disease only nineteen were attacked, and of these only two died. The inhabitants of the large hills in the neighbourhood of Salem, prohibited any communication with those of the valley; and it is said that they enjoyed an exemption from the visitation with which the latter were afflicted. Whether this immunity is to be ascribed to their precaution it is not in this place our business to inquire.† It re-appeared in a moderated degree at Salem and Sankerrydroog towards the end of August 1819, after a long continuance of rainy weather.

† *Note.*—The exemption of the Hill tracts in the neighbourhood of Salem has continued to this day. (W. R. C.)

Trichinopoly.

The first case of cholera observed at Trichinopoly occurred about the end of October in one of a Company of Native Soldiers, which had entered that place from the northward. Two men of the Company had previously died on the march in consequence of attacks of cholera; and this man, who also soon died, was attacked before his arrival.

On the 1st of November another fatal case occurred in the village of Pootoor. About the 5th several persons, especially of the washermen's families, were attacked in the neighbouring villages of Warriore and Pootoor, and some of them died before assistance could be procured. A few fatal cases at the same time occurred on the outside of the north-west gate of the fort towards the river.‡ From that period the number of cases daily increased, and the disease gradually extended itself from the north-west to the south-east gate of the fort; on the 9th it manifested itself in the barracks of the European Pensioners and Native Veteran Battalion situated in the immediate vicinity of the river gate of the fort; about the 13th in the Artillery barracks situated on high ground on the southward of the fort; and on the night of the 16th in the barracks of H. M.'s 53rd Regiment situated on elevated ground on the south-west side of the cantonment. It continued to increase in prevalence until the 20th; but after the 22nd it began sensibly to dimi-

‡ *Note.*—It is noteworthy that the north-east corner of the fort is generally the first locality to feel the cholera influence. (W. R. C.)

nish, and soon afterwards declined rapidly. About the middle of January 1819 it recurred in a moderate degree, but after two or three days it began speedily to disappear. Many cases were reported to have happened among the native inhabitants of the town and neighbouring country in July 1819, and in some parts of the district during August and September. The disease showed itself again at this place about the middle of November, and it prevailed to a considerable extent in the early part of December 1819.

Tanjore.

It reached Tanjore and its neighbourhood about the 20th of November, soon become very frequent, continued to increase irregularly during December, and attained its acme about the middle of January 1819. It began soon afterwards to decline; but its decrease seems to have been slow and irregular.* It did not disappear until April 1820.

* Note.—The irregularity and long continuance of cholera in Tanjore is, as marked now, as it was in the invasion recorded by Scott. (W. R. C.)

Madura.

Continuing its progress to the south it appeared at Madura about the end of November, and soon became diffused over the adjacent districts of Dindigul and Ramnad. Its course in these districts has been irregular and protracted so long that in some places it did not cease to be general until March or April 1821. At several places it had declined and almost disappeared, but returned without any evident cause: it was very general and destructive over the whole of the Madura District in the month of June 1819.† In the districts of Madura and Dindigul the endemic fever prevailed to a great extent at the same time with the cholera.

† Note.—The Madura District is still remarkable for the persistence of cholera when the district is once invaded. (W.R.C.)

Palamcottah.

At Palamcottah it began to prevail in the beginning of January 1819, and it had declined considerably before the end of that month. It disappeared from the inhabitants and troops previously stationed there, early in February; but the 1st Battalion 15th Regiment, which had returned from Ceylon, continued to suffer from it till near the end of that month. It was sometime afterwards reported by natives that the disease prevailed in different parts of the surrounding country, but no cases were again observed at Palamcottah until the beginning of September. Many cases occurred here in September and December 1819 and in January and the latter part of April 1820. It prevailed also to a considerable extent in the town of Tinnevelly in April 1820.

Having now given some account of the course of this epidemic along the eastern and interior territories of this Presidency, it only remains to advert to its progress along the Malabar Coast.

Dharwar.

It seems to have prevailed at Hullyhall and Soouda early in September 1818, and to have continued there for several weeks. These places are situated to the west and south of Dharwar, where it has been seen the disease was prevalent during the latter part of August.

Mangalore.

Some cases occurred at Mangalore, especially among the prisoners, from the beginning to the 20th of September;‡ but the disease did not then become general. It recurred with considerable severity on the 8th of November, and did not disappear till towards the end of January 1819.

It re-appeared in March 1820 in the frontier towns of Soonda, having spread, according to report, from the adjacent Mahratta States. In June it had extended southwards to Mangalore. The symptoms were extremely violent and caused death in many instances in two hours. The mortality was very great, and the inhabitants fled in terror from their villages to the jungles.

‡ Note.—With reference to the time of appearance of cholera in the western coast stations it must be remembered that in Scott's time, all communication with other parts of India was closed from May to September, during the violence of the S. W. Moonsoon. (W.R.C.)

Cannanore.

Cases were first seen at Cannanore on the 5th of December. The subjects of these cases lived in a place near the beach, and on the side of the town next to Tellicherry where the disease had for sometime prevailed. The disease immediately became pretty prevalent in the town, and soon afterwards in the neighbouring villages. In the former it began to decline about the 14th, and in the latter a few days afterwards. It seems to have disappeared before the end of the month; at most only a few partial cases afterwards occurred. A much greater quantity of rain than usual is said to have fallen at this place in the preceding monsoon, and during October and the greater part of November the weather is said to have been calm and sultry. Towards the end of the latter month the land-wind began to blow with some force; the atmosphere was cloudy for a few days; some rain had fallen, and the night air towards the morning was so chill that the natives complained of the cold. No case had occurred in the fort during the prevalence of the disease, but about the 10th February 1819 several of the prisoners in the jail were unexpectedly attacked. In the course of the seven following days twenty-nine of these people were attacked. The disease then disappeared without having extended beyond the jail.

Tellicherry.

About the middle of November a great alarm was created among the inhabitants of Tellicherry by the exaggerated accounts of the mortality produced by the cholera at Mangalore, and in H. M.'s 69th Regiment then approaching Cannanore. Very few cases, however, occurred until the 25th of November. During December it prevailed to a considerable extent among the poorer classes of the people, especially the beggars and fishermen of the lowest order; and of these the aged and infirm and dissolute were the greatest sufferers. No soldier, policeman or prisoner was attacked. The disease disappeared early in January. The weather in November had been variable, rain having occasionally fallen, and a strong southerly wind having sometimes prevailed. The thermometer was from 74° to 82°. About the middle of December the weather became dry and agreeable, the wind blew from the land; but this favourable change did not seem immediately to influence the prevalence of the disease.

Malabar.

This disease, it was reported, became prevalent in different districts of the province of Calicut in October. At Calicut two cases had occurred in May, but it would seem that no more cases were observed there till about the middle of October. Towards the end of December its symptoms, which had hitherto been moderate, became much aggravated, and its attacks more frequent. The prisoners and Police Corps now began to suffer. It declined considerably in February 1819; but it continued to exist generally in a less severe and less prevalent degree in some districts of the province until October following. In July and August it was more prevalent and violent than during the interval which had elapsed since the commencement of its decline. The poorest of the people who suffered great privations were chiefly its victims.

Cochin.

It appeared in the neighbourhood of Cochin about the 8th of December, and immediately became pretty general. It declined towards the end of the month, and disappeared early in January 1819. Some partial cases occurred among the soldiery in March, April, May, and July 1819.

Alleppey.

It seems that several slight cases occurred at Alleppey early in October, and that the disease became pretty prevalent there about the beginning of November. Several cases appeared also in July following.

Quilon.

At Quilon it began to show itself about the end of October, and continued to advance slowly until the middle of November. It then declined, and, without having prevailed to any considerable extent, soon afterwards disappeared. Only four Europeans were attacked, although an European Regiment and a detachment of Artillery were stationed at that place. Some troops on their march from Palamcottah to Quilon in January and March 1819 experienced a visitation of the disease. In July and August following many cases occurred in the 89th Regiment and among the native inhabitants. It was reported to prevail in the northern parts of Travancore nearly at the same periods at which it visited Quilon.

Trevandrum.

It seems to have reached Trevandrum about the middle of January 1819. Slight cases of cholera had been frequent there in May 1818, and a few had also occurred towards the end of August and early in September. From this place it gradually extended south to Cape Comorin. Reports of its prevalence at different places in the southern part of Travancore were made during the first half of 1819; but, as the veracity of these was dependent upon the natives, no correct estimation of its violence or prevalence can be formed.

The preceding narrative embraces the principal occurrences of cholera during the years 1818, 1819, and 1820 as they affected the soldiery in quarters and the fixed population of places within the territories of this Presidency or those connected with it."

I have added a few notes to this most interesting narrative, which is, I think, all the more valuable at the present time, because it was compiled not to illustrate any "theory" of invasion, but to record, in a connected form, the testimony of the Officers of the Medical Department, who had personally witnessed the outbreak of this, the first epidemic invasion in modern times. Mr. Scott's map of the Presidency, with dates of cholera appearance at various places, I have had re-drawn, and I shall have to refer to it hereafter when I come to discuss the subject of monsoon influences on cholera, and especially the theory that cholera cannot advance, except when forced forward by monsoon winds.

DRAWN ON TRANSFER BY V. VARDARAJA MOODELY, 1871.
LITH? BY R. J. BALDREY GOVT LITHC PRESS FORT ST GEORGE MADRAS.

THE CHOLERA INVASION OF 1859.

Dr. Bryden's researches fail to give any account of the invading cholera reaching Southern India in 1859.

10. Dr. Bryden, in tracing out the earlier history of the epidemics spreading from the endemic centre in Bengal, remarks (paragraph 118 of his report)*—" For four years after 1852 Northern India remained free from cholera, until the invasion of the epidemic of 1856. This, probably the greatest of all our Indian epidemics, owed its greatness perhaps to its geographical repression; although a true invading epidemic in the south, this limb was weak in comparison to that invading to the north, and it was not until 1858 that it reached Aden." Now this cholera of 1856 travelled down its appointed course through the Central Provinces, the Bombay Presidency, and the Deccan, invading Madras territory in the usual manner, and overlapping a large extent of territory during the year 1857. If we may judge of its ravages in the Mysore country and amongst troops marching in Southern India in the early part of 1857, it had lost none of its strength on reaching this Presidency. However it is not of the cholera of 1856 that I wish to say anything, but of the invasion of Bombay and Madras in 1859. Unfortunately Dr. Bryden's researches do not help us to understand anything about this particular cholera. The indices he trusted to, the Civil Medical Returns of the Central Provinces, did not afford him any information as to the pathway by which the invading cholera of 1859 left the endemic area and attacked the whole of the Bombay Presidency and Western Coast of India, from Kurrachee to Cape Comorin. Dr. Bryden's maps for 1858 and 1859 afford no indication that cholera moved out of the endemic area in the latter year across the Central Provinces towards Bombay and the Deccan, but it is nevertheless the fact that the Bombay and Madras territories were in that year invaded by a great cholera, while, if we are to trust to Dr. Bryden's figures and maps, the invading cholera of that year stopped short in what he calls the " eastern division of the epidemic area," viz., the districts eastward of Gwalior, Saugor, and Jubbulpore. It is somewhat strange that a cholera map should have been drawn for 1859 so as to show a complete exemption of the western and southern tracts, the more especially as it is evident from the report that Dr. Bryden was acquainted with the fact of the invasion of Bombay in that year. The map in question is wholly misleading. It may be thought perhaps that the severe cholera of Western India in 1859, was a portion of the cholera wave of 1856 that had reached the Red Sea and caused frightful mortality in the autumn of 1858; but, if so, then the cholera of that invasion took a wholly unprecedented course in striking, first the Arabian and African coasts, and then returning again to the Western Coast of India with redoubled virulence. I incline to the opinion that the new cholera invasion of 1859 did pass over the Central Provinces, and that Dr. Bryden's indices of that year have led him into error in describing that tract of country as free of cholera in 1859. The Madras Army Returns for 1859 show cases of cholera at Kamptee, both in June and July, and it is quite clear that this station was under the influence of epidemic invasion, and it would seem probable that Dr. Bryden's data being too limited for the purpose, failed to inform him of the south-western

Notice of the 1856 invasion.

* A report on the Cholera of 1866-68, and its relations to the Cholera of previous epidemics, by James L. Bryden, M.D., Surgeon, Bengal Army, Statistical Officer attached to the Sanitary Commissioner with the Government of India, Calcutta, 1869.

progress of cholera in 1859. However this question may be ultimately settled, there remains the fact that Western India was covered with cholera in 1859, from Kurrachee in Scinde, to Travancore in the extreme south of the peninsula. Not only the Western Coast, but almost the whole breadth of the peninsula, down so far south as the 14th degree of N. Latitude was under the influence of the epidemic.

Western India and the whole peninsula down to the 14th degree North Lat. covered by cholera in 1859.

11. From the Returns of the Bombay Army for 1859-60, given in the Appendix to the Report of the Royal Sanitary Commission for India, I have extracted the following figures which illustrate in some degree the distribution of cholera in 1859 in that Presidency.

Cholera in the Bombay Army, 1859.

Stations.	European Tproos.		Native Troops.		Total.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
Mhow	...	...	...	...	...	...
Bombay	13	8	33	16	46	24
Sattara	1	1	8	3	9	4
Kolapore	...	...	15	5	15	5
Belgaum	...	...	3	1	3	1
Ahmedabad	...	...	22	13	22	13
Baroda	7	5	6	1	13	6
Muligaum	4	2	12	5	16	7
Poonah	70	37	21	7	91	44
Kirkee	7	3	...	...	7	3
Nusserabad	2	1	...	...	2	1
Deesa	...	...	...	...	...	...
Sholapore	1	1	10	2	11	3
Surat	...	...	11	4	11	4
Hyderabad (Scinde)	...	...	...	...	...	...
Kurrachee ,, ...	10	2	...	...	10	2

These figures are for the official year ending March 31st, 1860, but I have ascertained that cholera caused nearly the whole of the mortality in the latter nine months of 1859, and if any confirmation of the fact of the early invasion of that Presidency in 1859 be wanting, the Mortuary Register for the town of Bombay will supply it.

Cholera deaths in the town of Bombay, 1859.

—	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Cholera mortality in Bombay in 1859	9	10	9	7	69	843	329	170	41	83	131	282

Here we have evidence of cholera spreading epidemically in Bombay in the month of *May* 1859.

12. Coming on southward to the Madras Presidency we find cholera attacking Hyderabad in the Deccan with exceeding force in the month of May. The cholera mortality in the city during that epidemic was something appalling, and to this day the cholera out-break of 1859 is remembered by the native inhabitants as one of the severest visitations that ever afflicted them. The particulars in regard to troops at Secunderabad will be found in the tables in the Appendix. Pursuing its way southward, the invading cholera attacked Kurnool, Bellary, Ghooty, and Cuddapah, in the same month or early in June. In an easterly direction it overflowed the Eastern Ghauts, and affected the Vizagapatam, Godavery, and Kistna coast districts in June and July. Nellore was also affected, as the Civil Dispensary returns show thirty-six cases treated. But this eastern extension must have

Invasion of Hyderabad in the Deccan.

Kurnool, Cuddapah, Bellary, and Ghooty.

Vizagapatam, Godavery, and Kistna Districts.

Nellore.

stopped short somewhere between Nellore and Madras, for the Presidency town during the latter half of 1859 was singularly free of cholera.

Limit of Invasion on Eastern Coast, south of the town of Nellore.

13. Turning now to the Western Coast, where the Madras Presidency joins on to Bombay, we find cholera in great force in North and South Canara, and in Malabar; in the latter district it broke out in July on the banks of the Ponani river, causing 8,427 deaths in the last six months of the year. It was in the month of October of this year that cholera broke out with such extreme virulence in the Calicut Jail, causing one hundred and fifteen deaths out of a strength of 412 prisoners. In the town of Cochin it prevailed all through August, September, and October. In the Travancore country it was active about the same time.

Western Coast districts invaded from Bombay territory.

Calicut Jail—Great mortality in October 1859.

Cochin.

Travancore.

There were a few cases at Cochin so early as March 1859, and with reference to these the following extract is worthy of note:—

Particulars of early cases in Cochin.

"Cholera in March 1859 did not exist in Cochin or the surrounding country when a sporadic case occurred, which terminated fatally about four miles from the town. The same evening the corpse was brought to the fort. The following morning a woman, living in the same street, was attacked and died in the Dispensary. Another case occurred two doors from this person's abode, and the fourth in the Dispensary where No. 2 had died. Subsequently the history of succeeding cases could not be followed out. On March 24th a gentleman, six miles from Cochin, died of cholera. Two days previously he had spent a day in Cochin in the same house in which the body of case No. 1 had lain on the 20th instant; after this person's death his child was seized with premonitory symptoms, vomiting, purging, rapid and weak pulse, which, however, gave way to treatment. Two natives, who had come from Trichoor, forty miles distant (where cholera did not exist) to see the deceased, left the place immediately, but it was too late. They also fell victims. One went to Ernacollum, three miles from Cochin, where he died; the other returned to Trichoor, where he also expired." (*F. Day. Med. Topography of Cochin, Madras Med. Journal, Vol.* 3, *page* 253.)

From the details of these so-called sporadic cases it is evident that cholera influences were in force, so far south as Cochin, early in March 1859. That these cases were the "outrunners," so to speak, of the invading cholera following in bulk some months later is, I think, quite conclusive. It is satisfactorily proved that there was no cholera in Cochin in the years 1855, 1856, 1857, and 1858, and in 1859 the cholera deaths amounted to 259, out of a population below 10,000.

14. This cholera of 1859 though covering so vast an amount of territory in a short space of time, did not pass down to the southern districts, below the latitude of Madras. Thus, as regards the southern districts, we gain the following particulars from the Dispensary Reports of the year:—

Exemption of the southern districts in the year of invasion.

Cuddalore.—"The latter months of the year have passed without any appearance of cholera."

South Arcot District.

Tanjore District.—"No epidemic."

Madura.—"No epidemic."

Trichinopoly District.—"The year altogether has been remarkably healthy and free from epidemic disease. Happily the cholera pestilence has not, as usual, made its appearance in the present cold season." The last cases occurred in

February 1859, and evidently belonged to a reproduced cholera of the 1857 invasion. The Military returns show two admissions, but no death, in November 1859.

Tinnevelly District.—"No epidemic prevailed during the year."

These brief statements have been verified by reference to the Dispensary Returns of sick treated, which show an absence of cholera generally in the southern districts.

Coimbatore and Salem.

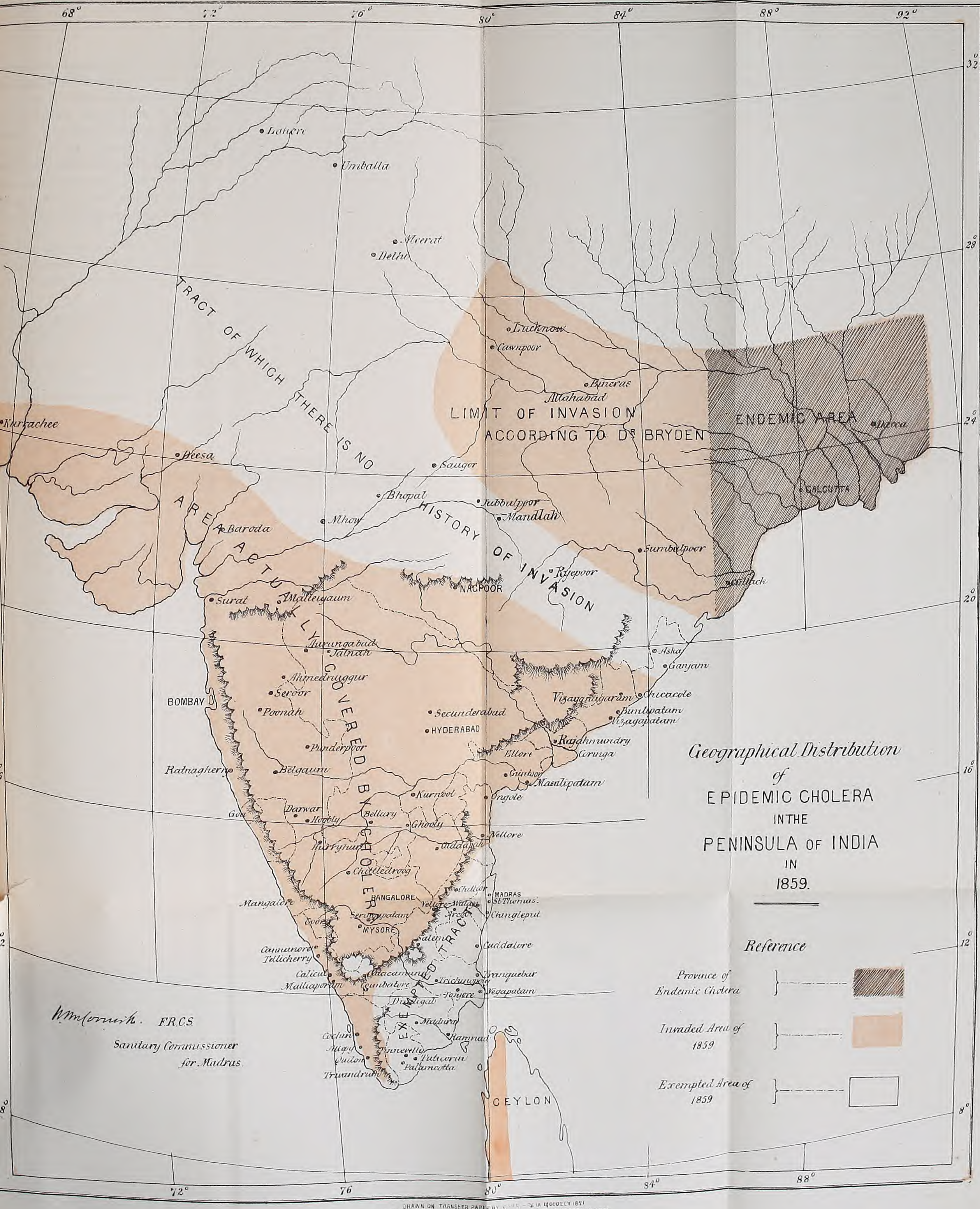
The districts of Coimbatore and Salem were not, I think, invaded by the new cholera of 1859. There were thirteen cases treated at each of the Civil Dispensaries at Salem and Coimbatore during the year, but these occurred in the early months, and belonged, I infer, to the former epidemic.

15. Such is a brief outline of the course of the cholera invasion of the Bombay and Madras Presidencies in 1859. The Army and Jail Returns for the Madras Presidency will illustrate still further the movement, and they will be found in another place. For the general outline I have in preference chosen the returns of the Civil Dispensaries as giving a more faithful picture of the condition of the population generally. To conclude then this brief summary of the 1859 invasion, we have found cholera pushing on from the Bombay territory, overlapping the whole of the Deccan, some portions of the Mysore Plateau, and Eastern Coast above the 14th degree of N. Latitude, and occupying the whole of the country below the ghauts on the Western Coast of India, from Kurrachee to Travancore. The Western Ghauts did, on this occasion, cut off the cholera almost completely from the districts to the eastward. From some miles to the north of Madras to Cape Comorin, the Eastern Coast districts presented an "exempted tract" in 1859. I have attempted to depict the cholera invasion of this year in a map. For the south-eastern extension of cholera towards Burmah, I refer the reader to the tables showing the cholera mortality in the Madras troops serving in that Province. It remains now to ascertain what happened to the exempted tract in 1860, and to the districts invaded in 1859, and under what circumstances the epidemic was, or was not, reproduced.

THE CHOLERA OF 1860.

Reproduction of cholera in Central Provinces in 1860.

16. The year 1860 has been spoken of as a year of invasion, in force, of the Central Provinces and of Western India. It is true that during the early months of this year cholera manifested itself in tremendous force in the Central Provinces, but it would seem, from the most recent evidence, that the invasion actually occurred during the former year 1859, when the western shores of India and the Deccan were attacked in so marked a manner, and that the cholera of 1860 in the Central Provinces was a reproduction of the invading cholera of the former year. Dr. Bryden shows cholera to have attacked the Jail at Hooshungabad in *May* 1860, but the truth is that cholera appeared in that town, and was prevalent in the Nerbudda valley, early in February, and probably even before that. Dr. Webster, of the 1st Madras Native Infantry, then stationed at Hooshungabad, thus records the facts:—"Cholera appeared in the station about the beginning of February. There was a large fair at the time in the station, the people forming the fair had come from a place where the cholera was, and there can be little doubt that they brought it with them. It raged violently in the city during the month of February, and notwithstanding every precaution was taken



Geographical Distribution
of
EPIDEMIC CHOLERA
IN THE
PENINSULA OF INDIA
IN
1859.
Reference
Province of Endemic Cholera
Invaded Area of 1859
Exempted Area of 1859
ENDEMIC AREA
LIMIT OF INVASION ACCORDING TO Dr BRYDEN
TRACT OF WHICH THERE IS NO HISTORY OF INVASION
AREA ACTUALLY COVERED BY CHOLERA
EXEMPTED TRACT
Lahore
Umballa
Meerat
Delhi
Lucknow
Cawnpoor
Benares
Allahabad
Dacca
CALCUTTA
Kurrachee
Deesa
Saugor
Bhopal
Jubbulpoor
Mandlah
Mhow
Baroda
Sumbulpoor
Ryepoor
Cuttack
NAGPOOR
Surat
Malleygaum
Aurungabad
Jalnah
Ahmednuggur
Seroor
Poonah
BOMBAY
Aska
Ganjam
Chicacole
Bimlipatam
Vizagapatam
Vizayanagaram
Secunderabad
HYDERABAD
Rajahmundry
Coringa
Ellore
Masulipatam
Punderpoor
Ratnagherry
Belgaum
Kurnool
Ongole
Goa
Darwar
Hoobly
Bellary
Ghooty
Nellore
Hurryhur
Cuddapah
Chitteldroog
MADRAS
St Thomas
Chingleput
Mangalore
BANGALORE
Serringapatam
Coorg
MYSORE
Arcot
Salem
Cuddalore
Cannanore
Tellicherry
Calicut
Malliaporum
Ootacamund
Coimbatore
Trichinopoly
Tranquebar
Tanjore
Negapatam
Dindigul
Madura
Ramnad
Cochin
Alleppy
Quilon
Trivandrum
Tinnevelly
Tuticorin
Palamcotta
CEYLON
Sanitary Commissioner for Madras.
F.R.C.S.

to prevent it, appeared in the Regimental Lines in the beginning of March." About the 20th February in this year the enormous crowd of pilgrims, assembled at Mahadeo in the Putchamaree Hills, was struck by cholera, and, in their dispersion, they scattered the disease far and wide. The city of Nagpore was affected about the 1st March, but the Military Cantonment of Kamptee had presented isolated cases of cholera so early as January. Some marching corps of General Whitlock's Saugor Field Force in returning to the Madras Presidency were attacked, two days after coming in contact with a body of cholera-stricken pilgrims. It is unnecessary in this place to quote the details of the cholera diffusion north of Nagpore in 1860, but no one can read the report of Dr. W. A. Smith (quoted at p. 410, Madras Med. Journal Vol. I., 1870) without being impressed with the importance of the dispersion of the Mahadeo pilgrims in spreading cholera through the Central Provinces.

The cholera of 1860 in Central Provinces a cholera of reproduction, the invasion having occurred in 1859.

17. That the cholera of 1860, in the Central Provinces, was a reproduced, rather than a newly invading cholera, is confirmed by the condition of the town of Bombay during 1860. An invading cholera of the Central Provinces is almost certain to reach the town of Bombay in the course of a year from the time of its movement out of the endemic area, but in looking to the Bombay Mortuary Reports for 1860, we find evidence that the invading cholera of the former year (1859) was dying out, but no evidence of fresh invasion.

Table showing Cholera Deaths in Bombay, 1860.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1860 ...	289	332	396	321	163	107	89	128	51	47	29	9

Here we see a steady failing of vitality of the epidemic going on all through the season of the south-west monsoon, and cholera still fading out when the monsoon season was past. If this cholera of the Central Provinces in 1860 had been a cholera of a new invasion, it would have reached Bombay in October or November *after* the south-west monsoon influences had ceased, supposing the theories in regard to monsoon influences to be true.

18. I have not at hand the Army Returns of the Bombay Presidency for 1860, but the point is of less importance, as we know the history of the northern stations of the Madras Presidency, and of Hyderabad in the Deccan, the districts in fact, which are always the first to be attacked by a cholera invading from the Central Provinces. In the Hyderabad country many of the troops returning from Whitlock's Column got cholera badly on the march in the early months of 1860, H. M.'s 17th Lancers especially. After the arrival of these troops at Secunderabad some cholera cases occurred, but there was no general epidemic. The year 1860 was one of great heat, drought, and scarcity of water. At Secunderabad many European soldiers suffered from sun stroke, but there was no return of the epidemic of cholera with the south-west monsoon. In one native corps a few cases did occur in June and July. There was but one "cholera" death amongst the Civil Dispensary patients, which is significant as to the absence of the disease in an epidemic or reproduced form among the Civil population.

At Bellary "no cholera or other epidemic during the year." There were two cases, but no death, in the European Regiment, and the Native Troops were quite exempt.

Ghooty in the Bellary District.—"No cholera."

Cuddapah.—There was a reproduction of cholera in 1860.

Kurnool.—Cholera broke out in *September* amongst the workmen employed in digging canals for the irrigation channels. The reproduction was not general in the district.

Mysore Plateau.—Over a great part of the Mysore table-land and even Coorg, cholera was reproduced in 1860. The troops at Bangalore suffered severely in this year.

North Arcot.—Cholera generally reproduced in this district in June, July, and August.

Nellore.—The town of Nellore was free of cholera, but it was reproduced in the district.

Invasion of Madras and districts to the south.

Madras.—When cholera began to reappear in June, in the districts to the northward, it moved forward in a southerly direction, and invaded this district and the Presidency town in great force, causing about 2,500 deaths in June, July, and August, in the town alone.

South Arcot.—This district was also invaded in 1860 in July; seventy-nine cases were treated at the Civil Dispensary, Cuddalore.

Tanjore District.—Invaded in force in June.

Trichinopoly.—Invaded in July; eighty-eight admissions in the Civil Dispensary.

Madura.—Cholera prevalent, though not bad, in the town; seven admissions.

Tinnevelly.—Cholera broke out in the town of Trichendoor in March, and in Tinnevelly not until November and December. The mortality in the district was very large. In the town of Tinnevelly alone, 423 deaths were reported from the 15th November to 4th January 1861.

19. We see here in this brief summary that in a portion of the tract invaded in 1859, that is the Hyderabad territory and Bellary District, cholera had nearly died out in the early part of the following season, while the epidemic moved on southward in force, covering the Mysore Plateau, and all the districts to the south of Madras which had constituted the exempted tract of the former year. This southward movement occurred while the south-west monsoon was prevailing. There yet remains to be noted the condition of a few other districts in 1860.

Coimbatore and Salem.

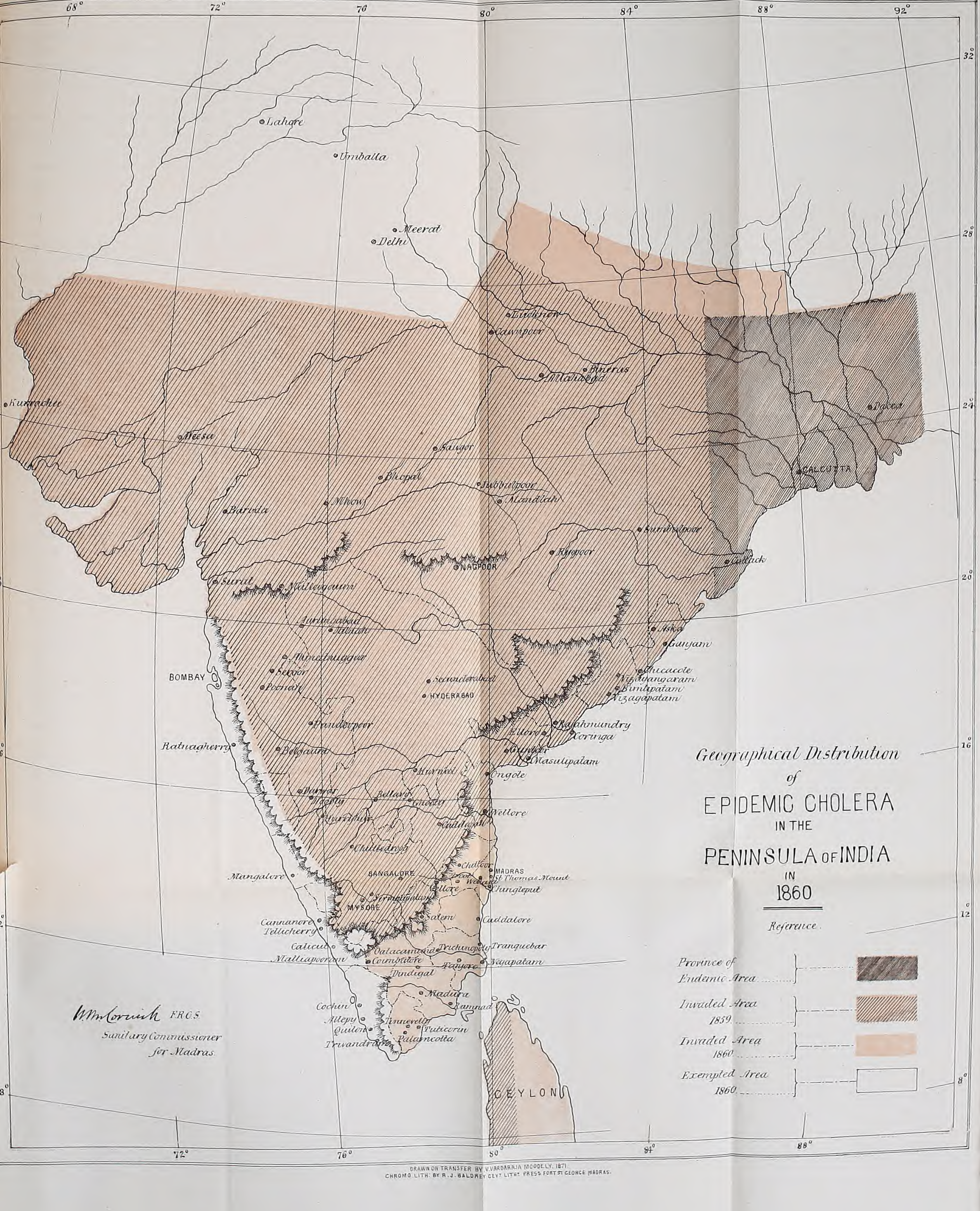
Coimbatore and Salem, both appear to have experienced a new invasion in 1860. In the ten principal streets of Coimbatore town there died 310 persons from cholera in October, November, and December.

Northern Coast Districts.

The condition of the Northern Coast districts from Ganjam downwards was as follows:—

No movement of cholera out of Ganjam in a southerly direction.

Ganjam.—At Berhampore cholera appeared in July, invading from the north-west, and pursued its course, according to Dr. Alexander, against the south-west monsoon wind. (This district lies in geographical contiguity to the endemic area of Bengal, as mapped out by Dr. Bryden.) If cholera was making its way out of the endemic area in this direction it did not get far south, for in the next district, Vizagapatam, there is no record of any epidemic.



DRAWN ON TRANSFER BY V. VARDARAJA MOODELY. 1871.
CHROMO LITH: BY R. J. BALDREY GOVT LITHc PRESS FORT St GEORGE MADRAS.

Godavery and Kistnah Districts.

All over the Godavery and Kistna Districts there was a reproduction of cholera in 1860.

Western Coast Districts.

The Western Coast stations, where the invading cholera of 1859 struck so severely, viz., Mangalore, Malliapooram, Tellicherry, Cannanore, Cochin, and Calicut, showed no cholera in 1860. The few cases at Tellicherry and Calicut in the beginning of the year were connected with the invading cholera of the preceding year. There was no reproduction on the Western Coast in 1860. The Bombay Mortuary Returns in fact afford a true index of the general dying out of cholera on this coast after the year of invasion.

THE CHOLERA OF 1861.

20. The Military station of Kamptee in the Central Provinces shows six cholera admissions amongst European troops in March and one in May, and Secunderabad in the Deccan only one cholera case in March 1861. The fact of these stations being nearly free of cholera will be regarded by some as a proof that no new invasion occurred in 1861 by the "south-western epidemic highway." But at the end of the year there occurs a very significant increase in the cholera deaths in the town of Bombay which would apparently indicate a new wave of cholera from an endemic area. Here are the figures for 1861 and 1862.

Deaths in Bombay indicative of a new invasion in December 1861.

Table showing the Bombay Cholera Deaths.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1861 ...	15	18	5	4	12	18	13	10	11	34	35	466
1862 ...	625	240	339	266	367	218	117	95	161	272	201	269

Coincidently with this accession of cholera in Bombay, we find the Western Coast stations of Madras, which had been free in 1860, again showing cholera, thus—

Calicut.—Cholera present in July, August, and December.

Cochin.—Cholera present from July to October.

Cannanore.—Cholera present in June, July, and August.

Tellicherry.—Cholera present in April and June.

Malliapooram.—Cholera present in August.

21. The question arises whether this cholera of the western tracts, in 1861 should be regarded as a new invasion of Western India, or as a reproduction. Under the reproduction theory we shall have to admit that a cholera may lie dormant for more than a year, and then revive in strength. It seems to be thought by Bryden, that there was no new movement of cholera in 1861 over the tracts invaded in 1859 and 1860, but the facts do not enable me to concur completely in this view. I think that a distinct cholera wave did invade Western India in that year, and that it ultimately got so blended with the former wave of 1859, in its subsequent progress, that it is now impracticable to trace either of them independently.

22. In this year, then, we find a general revival of cholera over most of the

districts of Madras invaded in 1859 and 1860. The only districts in which the disease did not generally prevail were Madura and Tinnevelly in the extreme south. No record remains of the general mortality of the population, though this must have been high, judging by the very general prevalence of cholera. In the town of Madras there were 2,776 deaths in this year from cholera.

THE CHOLERA OF 1862.

The cholera of 1862 a reproduction.

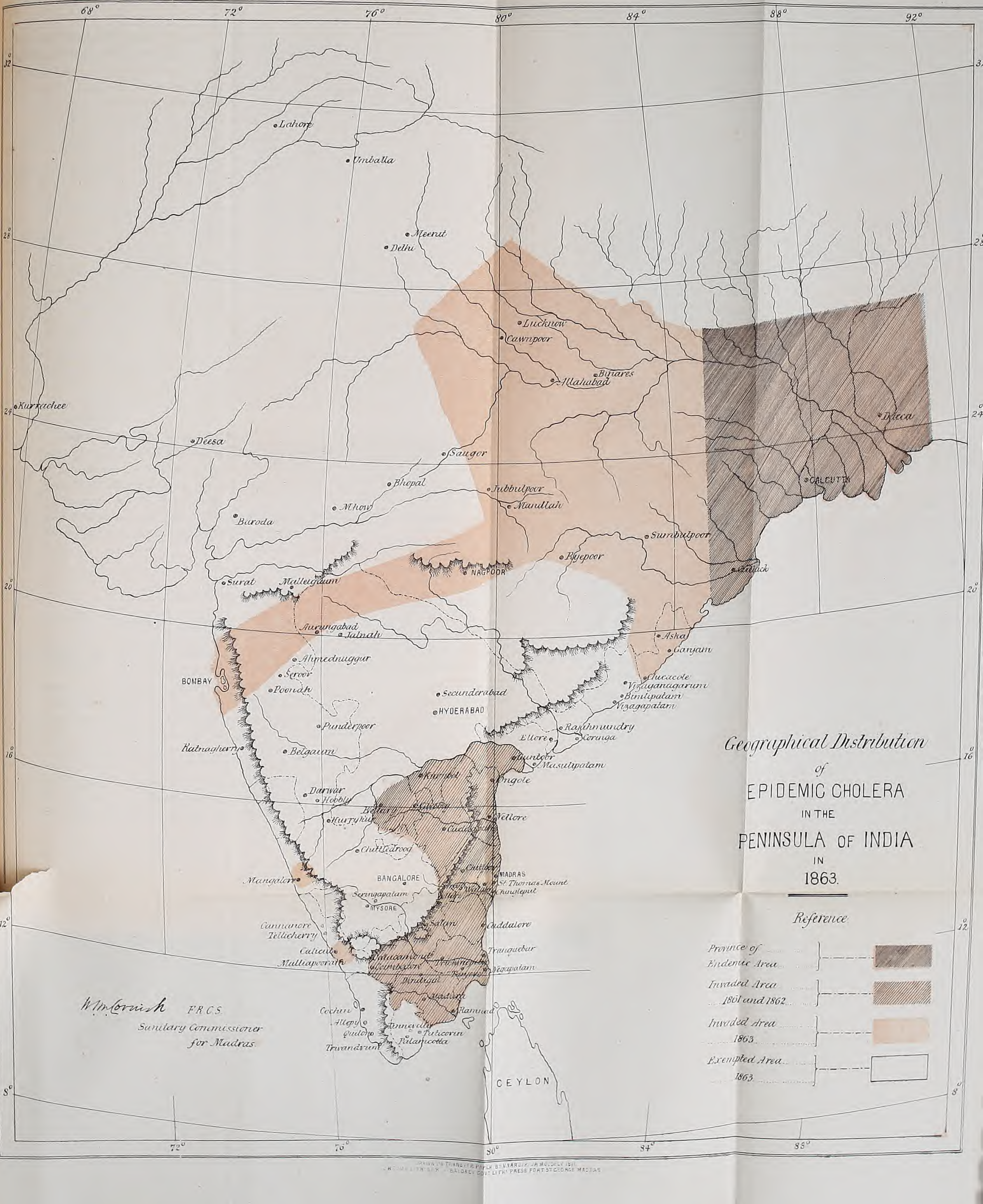
Exempted localities in 1862.

23. The cholera of 1862 was generally, I believe, a cholera of reproduction; but it had begun to die out. In Nagpore, cases occurred in August and September, and at Secunderabad it became common in June, July, and August. This fact, I think, favors the idea of a distinct new invasion in 1861. The Western Coast stations were free of it throughout the year, and so were the northern districts on the Eastern Coast, with the exception of Ganjam, which has always some cholera in it, owing to its position in regard to the area of endemicity. There was reproduction of cholera in Bellary, Kurnool, North Arcot, South Arcot, Madras, Nellore, Tanjore, Trichinopoly, Madura, Tinnevelly, Salem, and Coimbatore. In the town of Madras the highest mortality yet recorded occurred in this, the third, year from the date of the new invasion of the town. The total cholera deaths in the town were 3,635. A distinct accession of the epidemic occurred in Madras in June and July, and in October of the same year we find it advanced south-ward so far as Trichinopoly.

THE CHOLERA OF 1863—(A YEAR OF NEW INVASION).

24. The year 1863 is noted by Dr. Bryden as the period when a new epidemic sprung up within the Bengal provinces, and passing out by the "southern epidemic highway" travelled on to Eastern Africa, the Red Sea, and Egypt, and subsequently invaded Europe in 1865-66. There can be no doubt, I think, that a new body of cholera did spring up in that year, and that the Central Provinces were invaded by it in the month of June, though the Military returns give no evidence of its presence before July. The Dispensary at Kamptee, for the first time since 1860, shows thirty-five cholera admissions, and the Military Returns of the station confirm the fact that cholera was in motion in July. If we look to the Bombay Mortuary returns for 1863 and 1864, we shall see a great increase of cholera mortality as early as July 1863, with a later increase in December. Dr. Bryden holds that the invading cholera of the Central Provinces did not reach Bombay until December, but it must be remembered that this gentleman supports a theory, that invading cholera cannot move against a monsoon wind, and this may explain perhaps why the month of December has been pitched upon as the month of a new invasion. The ascertained mortality in the town of Bombay certainly does not warrant the idea of a new invasion of Bombay in December 1863, but points rather to the certainty that the cholera influence was in power there much earlier in the year, at the period in fact when cholera appeared in the Central Provinces. If it be a fact that cholera can cross the peninsula of India in June and July, in the teeth of the south-west monsoon, all theories founded on the dogma that a cholera invasion cannot progress against prevailing winds must necessarily fall to the ground.

The invasion of Central Provinces and town of Bombay in June and July.



Geographical Distribution
of
EPIDEMIC CHOLERA
IN THE
PENINSULA OF INDIA
IN
1863.
Reference
Province of Endemic Area
Invaded Area 1861 and 1862
Invaded Area 1863
Exempted Area 1863
W. R. Cornish F.R.C.S.
Sanitary Commissioner for Madras
68°
72°
76°
80°
84°
88°
92°
32°
28°
24°
20°
16°
12°
8°
Lahore
Umballa
Meerut
Delhi
Lucknow
Cawnpoor
Benares
Allahabad
Kurrachee
Deesa
Saugor
Dacca
Bhopal
Jubbulpoor
Mundlah
Mhow
Baroda
CALCUTTA
Sumbulpoor
Ryepoor
Cuttack
NAGPOOR
Surat
Malleigaum
Aurungabad
Jalnah
Aska
Ganjam
Ahmednuggur
Seroor
Poonah
BOMBAY
Chicacole
Vizayanagarum
Bimlipatam
Vizagapatam
Secunderabad
HYDERABAD
Punderpoor
Rajahmundry
Ellore
Coringa
Ratnagherry
Belgaum
Guntoor
Masulipatam
Kurnool
Ongole
Darwar
Hobbly
Bellary
Gooty
Vellore
Hurryhur
Cuddapah
Chittledroog
Mangalore
BANGALORE
MADRAS
St. Thomas Mount
Chingleput
Seringapatam
MYSORE
Cannanore
Tellicherry
Salem
Cuddalore
Calicut
Tranquebar
Mulliapooram
Coimbatore
Trichinopoly
Negapatam
Dindigul
Madura
Ramnad
Cochin
Alleppy
Quilon
Trivandrum
Tinnevelly
Tuticorin
Palamcotta
CEYLON

The following table exhibits a marked accession of cholera in Bombay in *July* 1863, and a rise in the mortality even earlier in the year :—

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1863 ...	89	50	89	161	133	161	412	240	178	181	176	319
1864 ...	622	401	302	680	837	395	371	351	232	88	137	431

Hyderabad not invaded in 1863.

25. The Hyderabad country does not appear to have been invaded in 1863. The Civil Dispensary returns at Secunderabad show no evidence of cholera, and the Military returns are a blank throughout. There was cholera, however, at Kurnool, Bellary, North Arcot, Madras, South Arcot, Tanjore, Trichinopoly, and Madura. The disease had completely died out in Tinnevelly and generally on the Western Coast, though a few cases are noted at Calicut and Mangalore. At Calicut a local, but virulent, outbreak in the jail resulted in the death of 88 prisoners, out of a strength of 325 in the month of March. The exhibition of cholera in such strength in this locality was probably indicative of the body of invasion following from the north. It was reproduced in great strength in the Coimbatore and Salem Districts in the early months of the year, and again in September and October. In the Mysore military stations cholera had died out. The districts north of the Kistna, and below Ganjam, were exempt.

In Madras cholera was very prevalent for the first three months of the year, when it seems to have exhausted itself and to have died out almost completely.

26. In this year we have the evidence of a new invasion of Western India, but the epidemic had made but little progress. The great body of the invading cholera had not reached the Madras Presidency during the year, and the epidemic advance was deferred until 1864. The greater part of the mortality of the year was due to the old, and not to the newly invading, cholera.

THE CHOLERA OF 1864.

Reproduction of cholera in Nagpore and Bombay early in 1864.

27. At the beginning of the year we find cholera in great force at Nagpore, in the month of February, and moving westward, covering a good portion of the Bombay Presidency. Dr. Bryden quotes from the *Bombay Gazette*, of 28th March 1864, the following passage in illustration of the great prevalence of the disease :—

" The Provinces of Central and Western India are suffering from the effects of an outbreak of cholera almost as deadly and wide-spread as that which, three years ago, ravaged Hindustan. Letters from most parts of the Bombay Presidency, and adjacent territories, give sickening accounts of the desolation which this fearful pestilence has made in the land. In Berar and Khandeish the people are dying by the hundred every day. From Surat we hear hardly less a sad tale, and although Bombay itself is still comparatively free of cholera, the districts of the Southern Concan have been stricken as heavily as Guzerat."

28. Turning to the report of the Bombay Sanitary Commission for that year, we learn that no division of the Army (except Scinde) escaped cholera in 1864, and that the outbreak amongst the assembled pilgrims at Purunderpoor was most disastrous in its results.

Report of the Sanitary Commissioner of Bombay.

29. Coming down to the Madras Presidency and its Military forces, we see that Hyderabad in the Deccan was again struck by cholera in August and September of 1864, but on this occasion the number of attacks and mortality was but small.

Invasion of Hyderabad in August and September.

The Kurnool District was next attacked and then Cuddapah; the Bellary District to the south-west of the main line of invasion escaped altogether in this year.

Bellary District not invaded.

The invasion of the Western Coast was markedly severe. As early as February 1864 cases appeared in Cochin, and it next broke out in that town in September, on both occasions after the arrival of infected crews from the northern ports. In the Malabar District there were reported 9,535 cases and 7,118 deaths. In Calicut alone there were 370 deaths. The invasion this year occupied not only the sea-board of the Western Coast, but overswept the hilly districts of Wynaad, Coorg, and Western Mysore.

Severe invasion of Western Coast Districts.

The occupation of these high lands in the year of a new invasion is, I have reason to suppose, significant of great strength in the cholera movement. The appearance of cholera, therefore, in Wynaad and Coorg, in 1864 boded ill for the inhabitants of the low country to the south and east in the following years.

Wynaad and Coorg invaded, and significance thereof.

30. The southern limit of invasion in 1864, so far as I can make out, was the North Arcot District. Although cholera had fairly invaded Malabar before the end of the year, the epidemic did not pass up through the gap in the ghauts to Coimbatore and Salem. Both of these districts, which had suffered severely from reproduced cholera in 1863, and in the beginning of 1864, were left untouched by the progressing invasion of 1864. The prisoners in the Coimbatore Jail were attacked severely in December 1863, and continued to suffer through the early months of 1864. The Madras District, South Arcot, Tanjore, and Tinnevelly had no cholera of this new invasion. The Nellore District had a few cases, but whether of the old or new cholera is uncertain. The Kistna, Godavery, and Vizagapatam Districts were absolutely free of cholera. It is possible, therefore, to show by a shaded map the nearly exact course of the cholera invasion of 1864. The year on the whole, but for the new invasion, would have been a minimum year of cholera in Southern India.

Limits of the invasion in 1864.

Exemption of the Kistna, Godavery, and Vizagapatam Districts.

THE CHOLERA OF 1865.

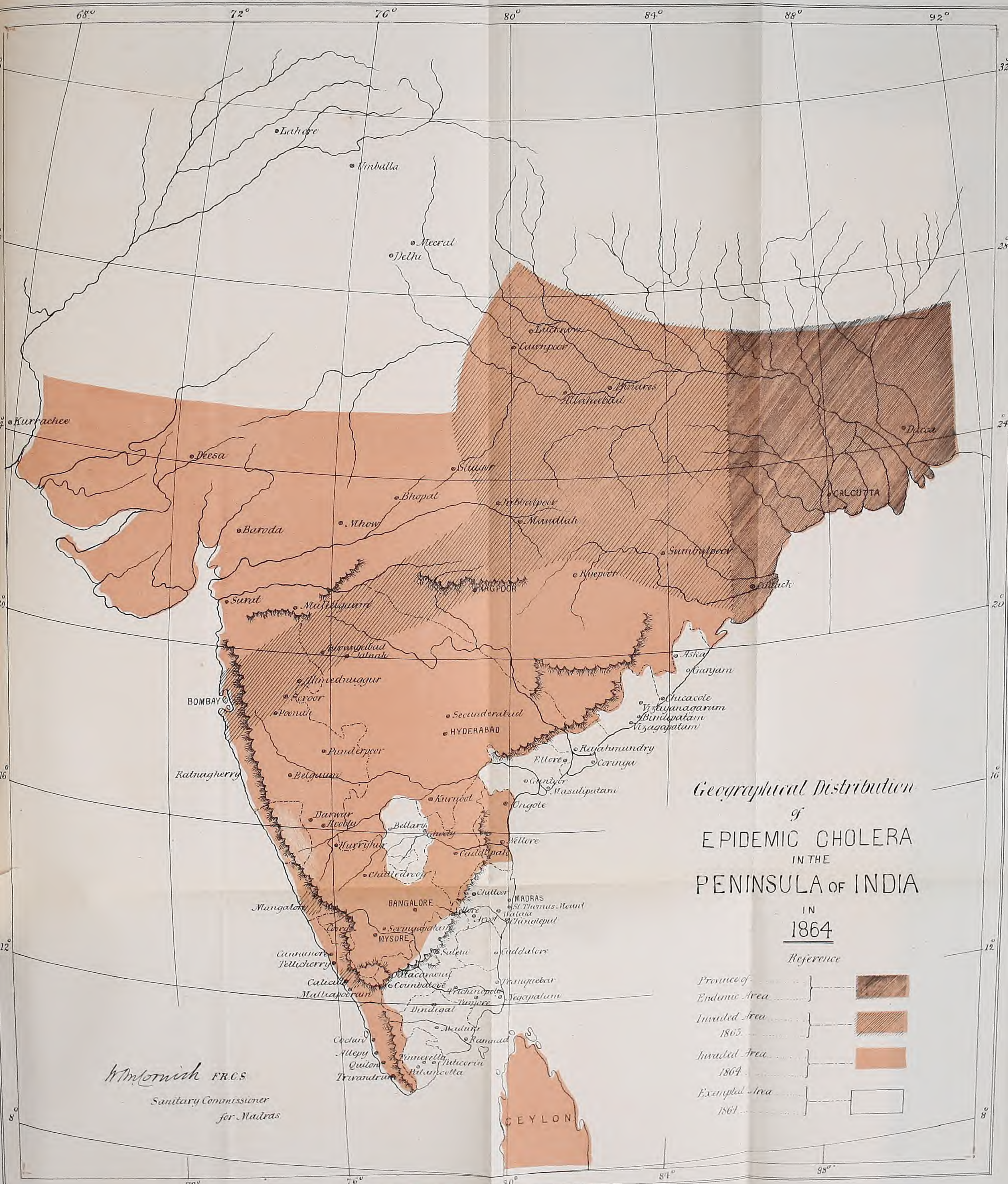
31. The cholera of the Central Provinces of 1864 and of Western Indian was almost universally reproduced in great force in 1865.

Reproduction in great force over Western, and many districts of Southern India.

For the first time, the death registers of the Civil population are available to trace the progress of the movement or reproduction in Bombay.

The following table will show the total mortality and months of chief prevalence of cholera among the population of the Bombay Presidency in 1865 :—

Population statistics of Bombay.



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Cholera in the Bombay Presidency, 1865.

	Divisions.	Population.	Cholera Deaths.	Months of greatest prevalence.
	Tanna	9,00,000	7,936	May and June.
	Surat	7,92,638	9,463	Do.
	Kaira	5,86,606	5,800	June and July.
	Kandeish ...	8,22,476	14,598	August.
	Ahmednuggur ...	12,52,789	15,609	April, May, and June.
	Poonah	6,79,429	9,114	Do.
	Sholapoor ...	6,34,867	3,593	April, May, June, and Jnly.
	Sattara	8,58,022	6,878	May and June.
	Kuludghee ...	5,63,123	3,055	April, May, and June.
	Belgaum ...	7,07,537	1,247	May, June, and July.
	Dharwar ...	7,82,465	1,191	June and July.
	N. Canara ...	3,94,040	327	Steady throughout the year.
	Rutnagherry ...	6,85,372	2,250	June and July.
Scinde	Kurrachee ...	3,40,000	300	August and September.
Scinde	Hyderabad ...	6,30,300	1,850	July, August, and September.
Scinde	Shikapoor ...	6,50,304	37	July and August.
	Upper Scinde ...	47,955	......	
	Thur and Parkur..	1,27,035	......	

32. The point to be noticed about this cholera in the Bombay Provinces is that it did not wait for the south-west monsoon to bring it into activity. In the Deccan Districts of Ahmednugger, Poonah, and Sholapoor, cholera was in force so early as April and May, and the virulence of the epidemic abated with the setting in of the monsoon. At Hyderabad, in the Deccan, cholera was reproduced early in April, and disappeared in June; a Native corps in marching from Madras to Hyderabad was struck by the disease, in the month of February, in the Nellore District. So early as February and March cholera began to move southward through Mysore, and from the southern districts of Bombay territory into the Bellary District, which had escaped invasion in 1864. But the most marked manifestation of cholera occurred in the Western Coast Districts, particularly in Malabar, where 40,000 of the inhabitants died. Cholera began to be active all through the cold dry months of the beginning of the year, and attained its greatest intensity in June and July. At Cochin it broke out with great virulence in the native town of Muttoncheri, and in the Jail nineteen of the prisoners, out of forty, were attacked; yet, while the pestilence was ravaging Cochin in this frightful manner, the prisoners at Ernacollum, in the Native State of Cochin, about three miles away across the backwater, though overcrowded and exposed to many insanitary conditions, never had a single case. Cholera was less violent in South Canara than in Malabar, but it prevailed with some severity in most parts of that district.

Cholera active and moving in Bombay prior to the advent of south-west monsoon.

Hyderabad, Deccan.

Invasion of the Bellary District.

Great mortality in Malabar.

Cochin Jail.

33. The epidemic advance on the eastern side of the ghauts proceeded through Hyderabad, Kurnool, and Cuddapah, to Nellore and the districts on the Eastern Coast. In Nellore a terrible epidemic raged from March until October, and the prisoners in the Jail suffered very severely all through March and April. It is noteworthy that during this season of invasion the hilly tracts of the eastern ghauts, between Cuddapah and Nellore, proved too slight a barrier to prevent the progress eastward. At Guntoor cholera began in the district in April and continued until the middle

Invasion of Nellore and Northern Coast Districts.

of August. At Cocanada, in the Godavery District, it was epidemic in June. The engineering stations in the Upper Godavery suffered very severely. Cholera visited also the Vizagapatam District, and in the endemic area of Ganjam to the north it was much more prevalent than usual. At the stations of Berhampore and Chicacole cholera prevailed from May to December.

Coimbatore.

Salem.

In the Coimbatore District the disease was brought to the Railway Station in March, and in July it came up in force through the gap in the Western ghauts, attacking the towns of Pollachy and Coimbatore. The Salem District suffered both in the beginning and end of the year. Travellers from the Western Coast brought up cholera also in June. One of these I saw on the Shevaroy Hills, near Salem, who had been seized with cholera a day after leaving Calicut. The case proved fatal, but no cholera broke out on the hills in consequence of the importation.

New invasion of Madras in August 1865, also of all districts to the south.

34. In its southward progress the invading cholera struck Madras in August, and then pursued its course affecting South Arcot, Tanjore, Trichinopoly, Madura, and Tinnevelly, so that, within the year, the whole of the districts which had not been occupied in 1864, were under the influence of cholera.

THE CHOLERA OF 1866.

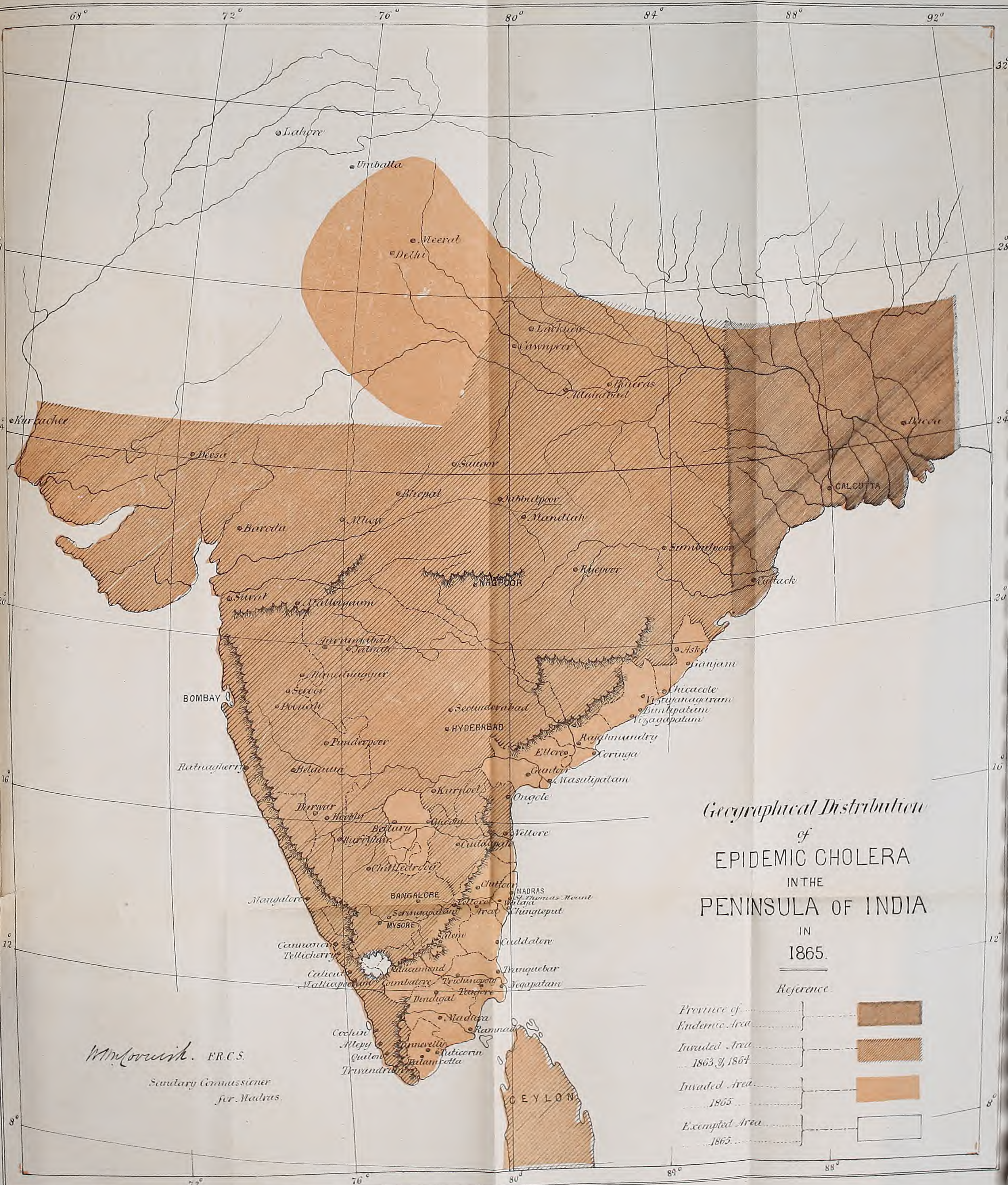
Scarcity and famine predisposing to great cholera mortality.

35. So general a distribution of cholera in 1865 augured ill for the health of the Presidency in the following year. There were general causes at work too, predisposing the population to suffer unduly from epidemic disease. The monsoons in 1864 and 1865 had generally failed ; large tracts of land remained uncultivated, and the prices of food had, in many parts, gone up to famine rates. In every district there was scarcity, and in Ganjam, Bellary, North Arcot, Salem, and Cuddapah, the poorer people suffered from actual want of food. The south-west monsoon rains of 1866, though late, were generally abundant, but prior to the advent of the rainy season the heat and drought were intense all over South India, and the general distress and impairment of vital power, from high prices and scarcity of food, were most prevalent.

Decline of cholera in Bombay Presidency, southward movement of the great body of cholera.

36. With regard to the Bombay Presidency which had suffered so severely in 1864 and 1865, it is interesting to note the steady southern advance of the epidemic, and the exemption in 1866 of the tracts desolated in the former two years. As regards the Bombay Army there was almost an entire immunity from cholera in this year; the only reproduction occurring at Poonah and Kirkee in August, when eight deaths occurred.

In the Bombay revenue districts there was almost complete extinction in every place where the severity of the epidemic fell in 1865, but some of the southern Collectorates had suffered but little in that year, and did not feel the full force of the cholera wave until 1866. The following table illustrates this most clearly :—



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Cholera Deaths in Bombay Presidency.

—	1865.	1866.	Remarks.
Belgaum...	1,247	1,962	Cholera revived in May.
Dharwar...	1,191	11,192	The epidemic in Dharwar revived in February and March, and was active till July.
North Canara	327	859	
Kuludghee	3,055	3,896	

37. In the Madras Presidency the system of mortuary registration, for the first time, came into force for the year 1866, and the statistics, though not quite perfect, will help to show how famine and poverty prepare the way for an unusual development of cholera. Although this was the *fourth* year of the exodus of cholera beyond the endemic area in Bengal, we find it actually more destructive in the Madras Provinces than in any former year of its existence. The following table exhibits the monthly deaths in each district :—

Mortuary statistics of Madras Presidency, for the first time, available.

Table showing Cholera Deaths in 1866.

—	Population for which returns were received.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Ganjam ...	10,16,265	2,376	4,246	3,710	2,452	1,135	4,032	3,833	1,628	717	347	242	211	24,929
Vizagapatam	7,98,877	34	154	58	345	53	149	2,149	4,784	2,172	1,176	492	129	11,695
Godavery ...	13,29,626	45	205	492	487	465	1,120	4,020	4,304	2,827	1,040	220	51	16,272
Kistna ...	7,92,744	1	2	138	301	258	521	464	1,204	1,967	613	75	47	5,591
Nellore ...	9,79,737	3	67	106	42	103	103	279	1,236	2,290	743	241	461	5,674
Cuddapah ...	10,40,878	1	30	130	229	425	235	1,229	4,358	4,901	2,096	879	310	14,823
Bellary ...	12,00,316	...	28	306	356	948	2,224	3,379	6,596	6,762	1,799	421	14	22,833
Kurnool ...	7,18,865	1	...	...	72	89	394	1,417	2,602	2,337	652	119	2	7,685
Madras ...	6,64,836	189	165	103	77	133	347	1,911	2,276	1,615	737	550	1,191	9,294
Madras town.	4,50,000	99	73	149	83	77	160	577	544	534	283	93	312	2,984
North Arcot.	10,69,685	613	515	158	78	84	446	802	2,120	1,809	772	1,425	1,653	10,475
South Arcot.	11,00,266	1,082	718	198	262	403	780	1,374	1,424	990	430	303	968	8,932
Tanjore ...	15,72,703	1,116	631	286	670	1,092	854	731	1,053	849	779	406	511	8,978
Trichinopoly.	8,35,887	1 144	597	260	551	520	384	889	731	626	450	543	473	7,168
Madura ...	22,29,378	1,382	824	349	579	340	258	250	379	607	1,155	2,662	3,216	12,001
Tinnevelly ...	13,63,051	848	185	117	18	91	95	63	53	106	152	324	1,134	3,186
Coimbatore.	12,09,740	479	206	269	558	448	225	180	136	545	2,159	2,664	1,508	9,377
Salem ...	14,93,221	819	728	623	547	800	813	1,173	1,350	1,531	1,506	1,518	1,185	12,593
South Canara	7,81,767	417	306	107	59	38	88	64	149	312	360	265	264	2,429
Malabar ...	17,16,852	64	111	97	92	22	13	127	2,143	883	242	181	67	4,042

38. This was, I believe, a true cholera of reproduction, favoured, in its terrible work of destruction, by the impoverished condition of the lower classes, and by their scanty and indifferent food. My reason for this statement is that the famine districts of Ganjam, Bellary, Cuddapah, Madras, North Arcot, Salem, and Coimbatore experienced the heaviest mortality, in proportion to their populations. It will be observed that although the mortality rose in most districts after the fall of the south-west monsoon rains, yet it continued to increase in very many places, all through the hot and dry months of the year, when there was no monsoon moisture to aid it. The table embraces the first general cholera statistics of the population of the Madras Presidency, and is of great value in illustrating the effects of seasonal changes upon a cholera of reproduction.

39. At the end of the year 1866 we see that cholera was still in force in Nellore, Madras, North Arcot, South Arcot, Tanjore, Trichinopoly, Madura, Tinnevelly, Coimbatore, and Salem, but dying out in other districts. In this year more than 200,000 persons (one-third of the whole number dying) were swept away by cholera.

200,000 cholera deaths in Madras Presidency in 1866

40. After a year of such general and severe prevalence of cholera—and that cholera too in the fourth year of its life—it was to be expected that no general reproduction would occur in 1867, and in truth the force of the existing epidemic was nearly exhausted at the end of 1866.

Dying out of epidemic in Western India.

Referring to the returns of the Bombay Presidency, we find that, in the European Army, cholera prevailed epidemically only in one station, Nusseerabad, where the mortality was heavy. In the Native Army there were only four deaths from cholera. There was some slight reproduction in many of the collectorates. But in the town of Bombay, cholera was nearly extinct, as it was in the southern districts of Dharwar, Belgaum, and Kuludghee.

Central Provinces.

At *Kamptee*, the military station of Nagpore in the Central Provinces, the year was said to have been singularly healthy. There was a single case of cholera in the Civil Dispensary, but no deaths occurred amongst the European or Native troops. At Secunderabad there were no cases treated in the Civil Dispensary, but two deaths occurred among the European troops in the third quarter of the year.

Secunderabad.

Deputy Inspector General Balfour, in his report (Appendix I. Cholera Report for 1869), says, that cholera lingered in the Secunderabad Cantonment from August 1866 until April 1867.

Kurnool.—At Kurnool there was cholera from February until August, and it was thought to have been imported from Secunderabad.

Bellary.—The Bellary District was particularly free of cholera during the whole year, only ten deaths having occurred in the whole district.

Cuddapah.—In Cuddapah there were 323 deaths in the district, chiefly the remnant of the 1866 cholera, as nearly all the deaths occurred in January and February. The town was free of cholera, and no admissions occurred in the Civil Dispensary.

North Arcot.—Cholera continued in this district through January, February, and March, when it sank to a minimum and remained dormant until December.

Madras.—In the town of Madras cholera caused 600 deaths in the first quarter, two in the second, none in the third, and eleven in the fourth. Here, and in the district, the invading cholera of 1864-65 was dead by the month of April 1867.

South Arcot.—In this district the epidemic was also generally dead in the first quarter of the year; but in the Chellumbrum Talook a local development of cholera occurred in July.

Tanjore District.—Cholera was prevalent in January and February, but declined with the approach of southerly winds. A new impetus was given to it in June, and the adjoining talooks of the South Arcot and Trichinopoly districts suffered from an accession of cholera during the south-west monsoon months.

Madura.—In this district cholera was active at the end of 1866, but it began to die out after January, and became extinct by the end of the year.

Trichinopoly.—Cholera prevailed in January, but gradually decreased to a minimum in May; increased in August and again declined, and became again active at the end of the year.

Tinnevelly.—Cholera was prevalent in January and February, after which it began to die out.

In Coimbatore, Salem, South Canara, and Malabar there were the same general features, viz., slight prevalence during the first two or three months of the year, followed by almost complete extinction.

In the *Northern Districts* cholera prevailed to some extent in the Kistna, which had suffered less than the adjoining district in 1866; but it faded out and died away in Nellore, Godavery, and Vizagapatam.

In Ganjam also there was a great diminution of cholera.

41. The main fact of the year in reference to cholera, was the almost complete extinction of the invading cholera of 1864-65. In the Tanjore and surrounding districts only, was there a revival in strength. The cholera of the Kistna District is said to have been aggravated by pilgrims returning from the Kurnool District, where cholera broke out at a festival early in the year.

The following table, constructed on the principle of that at page 27, is designed to show the monthly mortality in each district. The figures of each district should be compared with those of the former table. The total cholera mortality was 33239

Table showing Cholera Deaths in 1867.

—	Population.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Ganjam ...	11,82,349	99	42	16	21	18	26	15	118	15	7	118	53	548
Vizagapatam	14,24,652	40	21	12	16	10	10	16	9	1	6	1	3	145
Godavery ...	14,01,762	29	21	41	39	56	74	79	89	96	30	11	...	575
Kistna ...	7,26,398	48	34	316	1,283	437	340	220	455	436	66	65	...	3,700
Nellore ...	10,60,932	537	292	119	119	12	7	1	1	1	1	...	...	1,090
Cuddapah ...	10,91,920	114	50	34	81	9	9	15	3	2	1	5	...	323
Bellary ...	13,12,705	5	...	1	1	1	...	2	...	...	...	...	...	10
Kurnool ...	7,40,614	...	23	74	69	18	141	41	2	...	...	...	...	368
Madras ...	6 64,836	1,654	468	89	35	2	3	11	4	3	1	1	12	2,283
Madras town.	4,50,000	337	290	82	3	1	...	...	1	...	...	...	3	648
North Arcot.	11,47,896	1 417	698	228	33	16	23	9	1	1	3	3	79	2,511
South Arcot.	11,72,902	1,970	402	123	31	19	174	826	469	194	139	82	118	4,547
Tanjore ...	15,80,602	1,587	908	757	533	522	789	1,196	790	448	307	282	275	8,394
Trichinopoly.	8,90,673	519	189	72	45	15	22	37	231	186	34	37	252	1,639
Madura ...	8,27,554	1,259	416	153	92	28	14	32	8	13	18	7	16	2,056
Tinnevelly ...	13,63,051	1,398	472	182	105	37	12	12	11	6	2	8	9	2,254
Coimbatore	12,78,482	387	99	93	8	1	...	2	1	1	1	2	8	603
Salem ...	14,93,221	431	195	77	59	24	3	...	...	5	...	10	5	812
South Canara	8,09,150	203	46	17	23	20	16	38	20	21	13	15	30	462
Malabar ...	17,28,014	45	52	68	32	15	27	8	7	4	8	...	5	271

42. This table well illustrates the sudden declension of epidemic cholera over the whole area of the Presidency (with noted exceptions) after March. The first exception is that of the Kistna District in which cholera attained its maximum of intensity in April. It will be noticed also, that cholera had begun to increase in the Kurnool District in February, and so far as the records go, it was from this district that the seeds of the new out-break in the Kistna District came. Another exception is to be found in the Tanjore District and the adjoining talooks of South Arcot and Trichinopoly, where cholera, instead of dying out as elsewhere, revived in June and July, and was still prevailing at the end of the year. The history of this Tanjore cholera of 1867 I have no record of. (I was absent from India in that and the following year, and I have no data to guide me as to the causes influencing the increase of the epidemic in June and July, but I have a strong impression that this prolongation of the epidemic was promoted in the ordinary way, *i.e.*, by outbreaks at pilgrim sites, and the dispersion of affected persons.) I have already, in the Special Cholera Report for 1869, noticed the tendency of cholera to linger in the Cauvery delta, as if it were localized as an endemic of the soil.

THE CHOLERA OF 1868.

A year of minimum cholera.

43. The great immunity of Southern India from cholera during 1868, has frequently been adverted to. To complete the series of tables of cholera mortality, and to illustrate how completely an epidemic invasion may die out in this part of India, I append the monthly deaths in each district for 1868.

Table showing Cholera Deaths in 1868.

—	Population.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Ganjam ...	12,27,757	12	8	32	13	30	12	40	15	25	6	5	9	207
Vizagapatam	15,03,164	2	8	8	8	17	12	53	9	1	...	...	3	121
Godavery ...	14,23,436	3	6	...	...	...	...	...	...	...	...	...	...	9
Kistna ...	11,27,075	...	3	6	...	6	...	2	...	...	2	2	...	21
Nellore ...	11,61,442	...	...	...	...	6	...	...	...	...	...	...	...	6
Cuddapah ...	10,92,266	...	...	...	...	1	4	1	1	...	1	...	6	14
Bellary ...	10,96,235	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnool ...	7,70,728	...	...	...	...	...	...	...	...	...	...	...	...	...
Madras ...	6,56,945	6	6	1	...	5	3	...	...	...	3	...	...	24
Madras town.	4,50,000	7	2	2	...	...	...	...	...	...	...	2	...	13
North Arcot.	17,33,238	144	106	45	4	3	5	7	...	...	3	2	3	322
South Arcot.	9,66,579	151	92	35	114	113	10	7	4	17	2	3	2	550
Tanjore ...	17,19,479	1,399	675	121	58	50	47	52	42	14	7	19	24	2,508
Trichinopoly.	9,98,395	1,363	562	144	59	19	4	3	9	7	7	9	15	2,201
Madura ...	19,44,010	69	53	71	28	9	16	3	16	4	11	6	7	293
Tinnevelly ...	15,24,121	9	8	3	18	12	6	7	6	7	6	4	8	94
Coimbatore	14,14,252	5	125	99	118	7	4	2	2	5	1	...	...	368
Salem ...	15,25,945	404	74	497	59	3	4	12	1	1	7	4	5	1,071
South Canara	8,31,927	19	19	7	4	7	9	8	15	4	9	4	9	114
Malabar ...	18,50,329	24	13	13	19	12	4	4	7	1	1	...	2	100

Mild type of cholera in 1868.

The cholera, which spread apparently from Trichinopoly and Tanjore, to Salem and Coimbatore, in January and February, had become so mild in type, that, at Salem, the mortality to attacks was not more than ten per cent. In the town of Madras only thirteen deaths were registered during the whole year from cholera—a proof, if any were needed, of the extraordinary healthiness of the year, and of the complete extinction of the cholera contagium, brought in by the last epidemic invasion in 1864-65. In no former year of the fifteen, in which a register of deaths has been kept, had cholera so completely died out in the Presidency town, as it had in the year 1868.

44. And precisely at the period when cholera had ceased to exist as an epidemic in Southern India, a new emanation of cholera passed out of the endemic area in lower Bengal, and began to spread itself, in its accustomed manner, over the Central Provinces, the Bombay Presidency, and Hyderabad.

CHAPTER III.

THE CHOLERA INVASION OF 1869, AND ITS INFLUENCE ON THE CHOLERA of 1870.

Feeble vitality of the cholera of former invasion in 1868.

45. Before I describe the progress of cholera in Southern India during the year 1870, I shall take a retrospective glance at the epidemic history of the former year, to make plain to the reader the actual facts in regard to the cholera of 1870. In my report for 1869, I have shown that, throughout the year 1868, cholera was at its minimum in almost every part of Southern India. In a few of the revenue districts the remnant of the cholera invasion of 1864-65 had preserved a flickering vitality,

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but over very large tracts of country the disease was absolutely unknown for a considerable portion of the year. How feeble the cholera influence had become, and how it had worn itself out, in this the sixth year of its existence, may be illustrated by the following quotation from the report of the Inspector-General of the Indian Medical Department on Civil Dispensaries for 1868.

"In the Salem District an outbreak of cholera was reported in January, which at first seemed to assume such alarming proportions, that extra medical aid was sent from Madras, at the Collector's request. The disease, however, proved so remarkably amenable to treatment, and the mortality so unprecedentedly small (under nine per cent.), that the inference is that the epidemic must have been chiefly, if not entirely, one of bilious cholera or choleraic diarrhœa."

Cholera in Madras during 1868.

46. In the European and Native Armies, and in the Jails of Southern India, cholera was almost unknown in 1868. There were five fatal cases amongst European Troops, but four of these occurred at Kamptee, the Military Station of Nagpore, which station came under the influence of the new invasion, and one at Thayetmyoo, in British Burmah. Amongst the Native Troops there occurred forty cases, and eighteen deaths. In the thirty-nine Jails of the Madras Presidency there were only eight cases, and four deaths. The entire civil population of 26,000,000, which in 1866 (the third year of a cholera invasion) lost in round numbers 200,000 persons from cholera, had only 8,023 casualties from this cause in 1868, and this mortality was chiefly confined to the districts of Salem, Tanjore, and Trichinopoly, in which we have seen that the epidemic wave of former years had nearly exhausted its strength. And as regards the season of prevalence, it may be said that nearly all these 8,023 deaths occurred in the early months of 1868, and that cholera, as an epidemic, was dead throughout the Presidency in April 1868.

Cholera confined mainly to Salem, Tanjore, and Trichinopoly in 1868.

47. Dr. Bryden has recently, with great labour and patience, shown how the cholera epidemics of recent years have occupied certain areas in the North-West, and Central Provinces of India. It has been reserved for me to illustrate in what manner, and at what distance of time, these explosive waves of cholera from the Bengal endemic field, make themselves felt in the southern districts of the Indian Peninsula.

The movement of cholera in a south-easternly direction over Burmah and China yet to be investigated.

To Dr. Bryden we are indebted for a careful study of the movement of cholera, as observed in Northern and Central India. There yet remain to be registered the facts, as to the movements of cholera in an eastern or south-eastern direction, over Burmah, China, Cochin China, and South-eastern Asia generally. When this has been done, and with the present data for the history of recent epidemics of Southern India placed on record, there will be sufficient facts accumulated for determining the share aerial influences may have played in the diffusion of cholera in the eastern hemisphere. In the Appendix to this report will be found tables of the prevalence of cholera in the Madras Army stationed in Burmah, from the year 1859 down to 1865. The Sanitary Commissioner of British Burmah will be able to supply the further data for the Civil population, from that period.

Dr. Bryden has already indicated a new outburst of cholera from the great endemic centre in 1868. The map drawn by him, to illustrate the annual report for 1868 of the Sanitary Commissioner with the Government of India, does not, however, represent the whole truth, though it is quite

correct so far as it goes. Dr. Bryden has confined his observations to the western and southern tracts taken by the epidemic, but it is quite certain, that about the same time, or possibly a few months later in the year, cholera travelled out from the endemic area to the east and south-east, that is, it invaded Assam, Chittagong, and British Burmah, and was heard of at Mandalay the capital of Burmah in 1868. British Troops at Thayetmyoo suffered very severely in the month of April 1869, and it is well known that the disease was extremely prevalent in the valley of the Irrawady river. The fact of this south-eastern advance of cholera occurring simultaneously, or nearly so, with the south-western advance, should not be lost sight of, and it would add much to our interest in the subject, if it could be ascertained whether this south-eastern advance stopped short in the Tennaserim provinces, or whether it travelled on to Siam or China.

The south-eastern limit of cholera in 1868, unnoticed in Bryden's map of that year.

48. But with reference to the south-western diffusion of cholera in 1868, Dr. Bryden has shown that it advanced out of the endemic provinces to beyond Allahabad and Benares, and that it invaded the Central Provinces up so far north as, and a little beyond, the great Vindyah range of mountains, covering the whole country, from the Nerbudda, to south of the city of Hyderabad in the Deccan, before the end of the year. This cholera of 1868 was projected far into the Bombay Presidency, and reached the city of Bombay on 1st October, though it did very little mischief there. Its chief ravages in the Bombay Presidency were confined to the Ahmednuggur, Kandeish and Poonah Districts, and there it became epidemic in July or August. About the same time too it occupied the Deccan area of the Hyderabad country, and advanced slowly southward, both in the Hyderabad country and in the parallel latitudes of the Bombay Presidency. It is quite clear from the history of this cholera that it made a considerable move to the southward during the season of the south-west winds. By the end of 1868 cholera had not reached so far south as the Dharwar Collectorate in Bombay, nor had it crossed the Kistna river at the point where it is joined by the Toombudra below Kurnool, and, as regards the eastern extension of the invading epidemic, it may be observed that it stopped short somewhere in the Hyderabad country to the eastward of the capital, for the registration of deaths in the adjoining districts of the Godavery and Kistna proves that it had not passed into British territory in an eastward direction.

Invasion of the Deccan and Western India.

Limits of invasion in 1868.

49. In my Cholera Report for 1869 I have dwelt at some length on the circumstances connected with the invasion of Hyderabad in the month of November 1868, and I attempted to show how the epidemic passed on from thence in a southerly direction towards the eastern portion of the Raichore Doab, and how it invaded the Kurnool District, first manifesting its presence in a village on the high road from Hyderabad to Cuddapah on the 4th January 1869, and from this point gradually occupying the western portion of the Kurnool District. It was noted, moreover, that the epidemic in this district kept to the westward of the range of hills, which in this direction form a portion of the eastern chain of ghauts, leaving the sub-division of Cumbum wholly free of cholera. Since that report was drawn up, I have had an opportunity of perusing the Annual Report of the Sanitary Commissioner for Bombay and of examining the mortality tables of that Presidency, for 1869. It is most remarkable to trace how the cholera

Invasion of Kurnool District in January 1869.

Line of invasion restricted.

invasion in the Bombay Presidency kept pace with the advancing wave in the Deccan, and in the Ceded Districts of the Madras territory.

Thus we read that " in the Belgaum Collectorate cholera, after a little abatement in February, increased rapidly in severity, culminated in April (in which month occurred no less than 2,735 deaths) and disappeared altogether by the end of August."

In the Dharwar District, south of and adjoining Belgaum, " there was " an exceptional and rather severe outbreak of cholera in the Dharwar Talooka " in February, increasing in that talooka only in March, and decreasing, though " culminating in the district generally with 600 fatal cases, in July. During Octo- " ber the disorder may be said to have disappeared from the district."

In Kulludghee, east of and adjoining Belgaum, the cholera became severe in March, culminated in April, and abated in August and September.

No returns are given for the Native State of Kolapoor, but it is evident, from the spread of cholera all around it, that this area of country must also have been covered by cholera, coincidently with the appearance of the disease in the neighbouring districts of Sattara and Belgaum.

50. A tabular view of the cholera deaths in the Collectorates of Belgaum, Dharwar, and Kulludghee of the Bombay Presidency, compared with the mortality in the Ceded Districts of Madras, will illustrate how important it is, in the study of cholera movements, that the facts should be recorded, not in relation to artificial divisions of territory, but as a geographical whole.

Cholera in 1869.

Collectorates.	Kulludghee.	Belgaum.	Dharwar.	Bellary.	Kurnool.	Cuddapah.
Area in Square Miles ...	6,500	11,814	5,193	11,496	7,470	9,177
Population	7,01,556	7,91,263	8,49,223	13,04,944	7,70,857	11,44,759
Total Cholera Deaths in 1869	5,126	7,808	2,691	3,424	2,817	1,859
Months of prevalence.						
January	9	300	30	...	52	12
February	1	186	146	...	50	5
March	198	577	162	10	203	18
April	1,637	2,735	419	1	240	8
May	1,556	2,578	413	258	103	7
June	744	1,117	560	1,219	709	96
July	662	267	660	1,295	1,045	715
August	228	48	213	532	305	553
September	48	...	49	87	41	363
October	29	...	22	22	64	68
November	8	...	1	...	5	8
December	6	...	16	...	...	6

We see here that the general progress of cholera was in a south-easterly direction from the Belgaum Collectorate, through Dharwar, towards the Raichore Doab, and so on to the great cotton plains of Bellary. The Kurnool District was, as I have already shown, reached at an earlier period of the year *viâ* the Hyderabad country, though the culmination of the epidemic both in Kurnool and Cuddapah was coincident in time with the culmination in Dharwar and Bellary, but later in all these districts than in Kulludghee and Belgaum.

Exemption of the western coast from the invasion of 1869.

51. It is a fact to be noted here that the tract of country from Bombay to Cape Comorin, the western side of the ghauts, was not subjected to epidemic invasion in full strength by the cholera emanating from Bengal in 1868. It is true that a few deaths occurred in the town of Bombay in October, November, and December of 1868, and that a few isolated cases occurred in the Collectorates of Rutnagherry, North, and South Canara, but it is quite clear that the germs of the epidemic were not present in any force in the low-lying tracts of land below the ghauts. This will be apparent in the following figures:—

Districts.	Population.	Area in square miles.	Cholera Deaths in 1869	Remarks.
Rutnagherry	6,81,147	4,500	218	
North Canara	3,61,013	3,300	*531	* 363 of these deaths occurred in the Soopa Talook which is *above* the ghauts, and adjoining Dharwar.
South Canara	8,36,019	4,205	184	
Malabar	18,49,671	6,260	131	

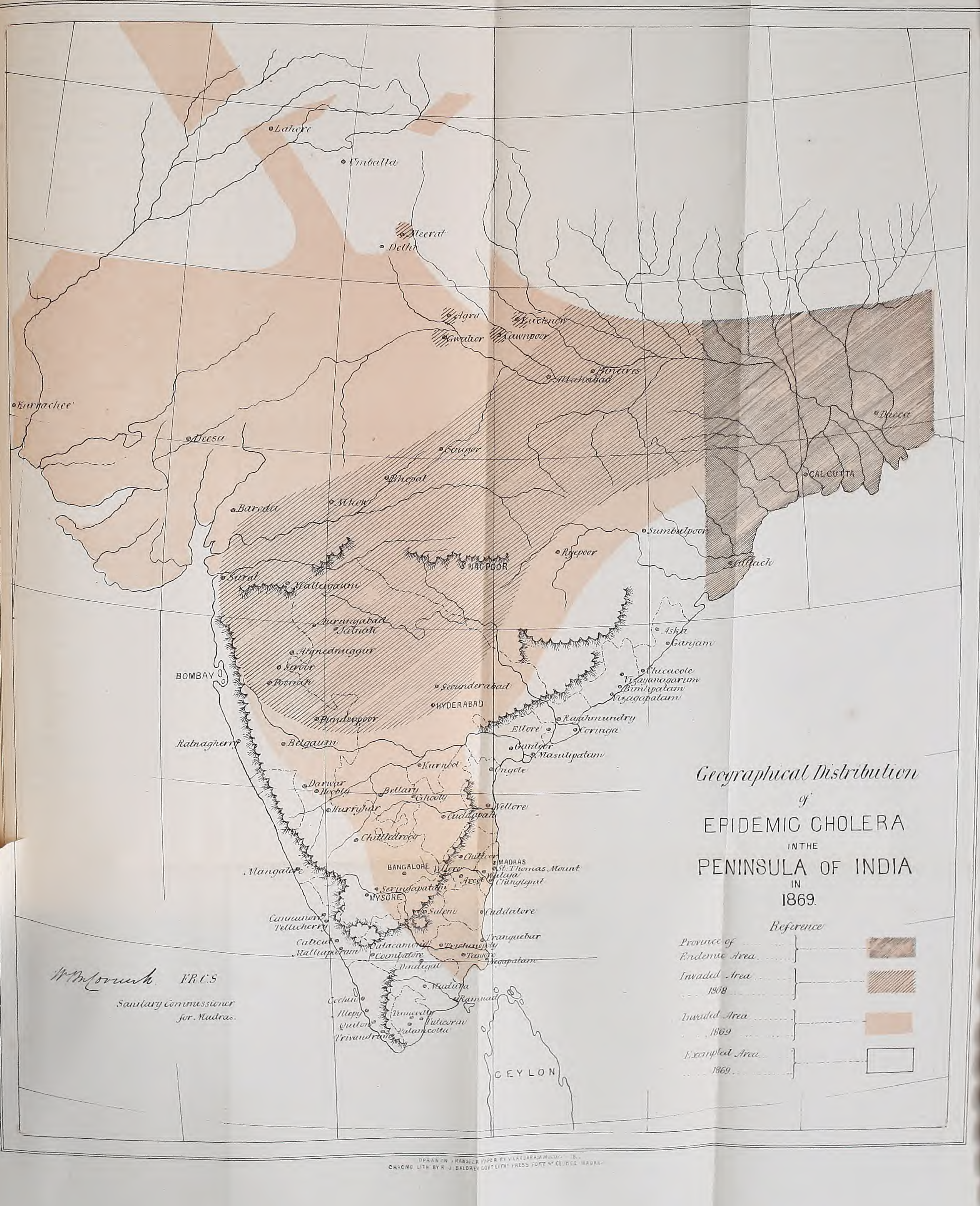
Non-invasion of Western Coast districts significant of deficient strength in the invading cholera.

52. The exemption of the tract of country below the western ghauts is a fact of some significance in the history of the cholera invasion of 1868. Having carefully examined the attainable data in regard to two former invasions of this Presidency, in 1859 and 1864, I have been led to form an opinion that an exhibition of great strength of cholera in a year of new invasion on the sea-board of the Western Coast Districts bodes ill for the Carnatic, and Southern India generally, while a minimum of cholera in those districts, during a year of invasion, would seem to show that the great body of the advancing cholera wave had been directed elsewhere, or had been lost before it reached Western India. Should that prove to have been the case in 1869, then the cholera of the Madras Presidency, now in the third year of its life, may be expected to lose its vitality in the present year 1871 or early in 1872.

Whether it is that the contagium of cholera getting into the low moist tract of the Western Coast Districts is hastened into activity by the peculiar climatology of that region, so similar in many respects to Lower Bengal (the natural home of cholera) it is impossible to say. It may be that an invading cholera reaching that coast is reproduced in such strength, favoured by a climate natural to it, as to form a new starting point of invasion. Whatever explanation may be advanced, the fact remains that a cholera occupying the Western Coast area is frequently reproduced in that area in the following year in enormous strength, and invasion of the Mysore Plateau and Eastern Coast Districts is nearly certain when the Western Districts are primarily invaded.

Geographical limit of cholera in 1869.

53. Cholera then, in its southward course in the year 1869, was geographically confined, so far as this Presidency was concerned, to the country between the Eastern and Western Ghauts, and only to the lower lying tracts of this region, and to the eastern sea-board, between the 10th and 15th degrees of North latitude. The great tract of Mysore table-land was not invaded, but the epidemic advanced southward and eastward through Kurnool, Bellary, Cuddapah, Nellore, North Arcot, and Madras Districts, to South Arcot, Tanjore, and Trichinopoly, where the Cholera Report for 1869 shows it to have been active at the end of that year, still progressing and invading the hitherto exempted tracts to the extreme south of Madura and Tinnevelly.



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54. The actual course of the cholera of 1869 will be best seen in the following table :—

Districts.	Kurnool.	Bellary.	Cuddapah.	North Arcot.	Nellore.	Madras.	South Arcot.	Tanjore.	Trichinopoly.
Population for which returns were received	7,70,318	12,57,147	11,44,759	17,75,506	11,34,757	12,08,007	10,92,958	17,17,268	9,90,037
Total Deaths	18,781	27,387	21,370	34,842	21,242	26,532	16,839	41,425	15,094
Total cholera deaths...	2,817	3,424	1,859	2,605	1,054	1,127	544	4,563	522
Months of prevalence.									
January	52	...	12	3	...	...	4	19	6
February	50	...	5	...	...	...	2	18	7
March	203	10	18	5	...	...	1	16	4
April	240	1	8	...	...	2	3	13	4
May	103	258	7	2	3	5	5	13	...
June	709	1,219	96	86	2	5	4	26	6
July	1,045	1,295	715	705	154	170	14	13	...
August	305	532	533	339	219	269	3	138	8
September	41	87	363	549	358	218	27	281	6
October	64	22	68	447	173	156	31	542	7
November	5	...	8	213	39	137	63	1,258	69
December	...	...	6	256	106	165	393	2,226	405
Proportion of Deaths to 1,000 of Population.									
January	0·06	...	0·01	0·001	...	...	0·003	0·01	0·006
February...	0·06	...	0·004	...	...	...	0·001	0·01	0·007
March	0·26	0·007	0·01	0·002	...	...	0·0009	0·009	0·004
April	0·31	0·0007	0·007	...	...	0·001	0·002	0·007	0·004
May	0·13	0·205	0·006	0·001	0·002	0·004	0·004	0·007	...
June	0·92	0·96	0·08	0·04	0·001	0·004	0·003	0·01	0·006
July	1·35	1·02	0·62	0·39	0·13	0·14	0·01	0·007	...
August	0·39	0·42	0·46	0·19	0·19	0·13	0·002	0·08	0·008
September	0·05	0·06	0·31	0·309	0·31	0·18	0·01	0·16	0·006
October	0·08	0·01	0·05	0·25	0·15	0·12	0·02	0·31	0·007
November	0·006	...	0·007	0·11	0·03	0·11	0·05	0·73	0·06
December	...	...	0·095	0·14	0·09	0·13	0·35	1·29	0·409

In looking at this table it must be borne in mind, what I have already stated at page 3, that cholera has a tendency to linger as if it were an endemic in some localities on the seaboard, and in some of the river deltas on the Eastern Coast.

55. The few deaths entered as caused by "cholera" in South Arcot, Tanjore, and Trichinopoly in the earlier months of the year may fairly be taken to represent the ordinary cholera of the coast. It is easy to see when the invading cholera reached the districts from the sudden rise in the figures. Thus the invading cholera of South Arcot evidently reached in *September*, the culmination of the epidemic in the Madras District, directly north of it, having taken place in *July* and *August*. In the Tanjore District the invasion seems to have taken place in *August*, and whether this was hastened by the assemblage of pilgrims in Nagore in that month it is not very easy to say. The fact, at any rate, is clear that cholera appeared during the Mahomedan festival at that place. In the Trichinopoly District cholera began its invasion late in *October*, and the mortality rose rapidly in *November*, and still more in *December*.

Madura and Tinnevelly not occupied in 1869.

56. We have now only briefly to glance at the districts that were empty of cholera in 1869 to see the direction that the epidemic was bound to pursue in the next year of its progress. These districts, in the extreme south of India, are shown in the following table :—

Exempted tract—Cholera of 1869.

Districts.	Population for which returns were received.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Madura ...	19,01,774	4	10	2	8	4	7	5	8	6	2	3	13	72
Tinnevelly ...	10,82,301	5	7	12	4	5	9	7	5	5	3	9	9	80

When we find the total of deaths in a district like Madura to be 18,688, and cholera returned as the cause of death (and that too by unprofessional reporters) in only 72 instances, we may fairly conclude that any epidemic invasion of former years had died out, and that the so-called cholera deaths were due, if correctly reported, to the ordinary cholera of the coast. And the same observation holds good in regard to Tinnevelly District, in which only 80 out of 21,808 registered deaths are noted as due to cholera.

The Madura and Tinnevelly Districts with the Western Coast Districts (including the Native territories of Travancore and Cochin) may be safely declared an " exempted tract," so far as the cholera invasion of 1868-69 was concerned.

Salem and Coimbatore.

57. The districts of Coimbatore and Salem suffered in 1869 to a very limited degree from an importation of cholera from the North Arcot District to the eastward, in the month of *September.* The particulars of the importation, so far as they could be ascertained, are recorded at page 17 in the Cholera Report of 1869, and the following table shows the monthly distribution of cholera in 1869 :—

Districts.	Population for which returns were received.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Coimbatore ...	13,93,582	2	...	...	1	1	1	4	3	8	64	60	60	204
Salem... ...	16,19,233	4	3	3	17	...	2	2	...	20	36	129	81	297

It will be seen that the mortality began to increase in these districts in the month of *September,* and it has been distinctly ascertained that the deaths were confined chiefly to the villages in the neighbourhood of the Railway stations, to which the first cases were traced.

Northern Districts.

58. We have yet to take cognizance of the condition of the northern districts on the Eastern Coast in regard to cholera, and then the survey will be complete up to the beginning of 1870.

Ganjam.

The Ganjam District abuts on the area mapped out by Bryden as the district of endemic cholera, and it is undoubtedly true that it suffers in common with the endemic district, as regards time and season, but although invasion of the southern districts along the Eastern Coast appears to have taken place in the epidemic of 1818, it has not been so, according to my knowledge, on any other occasion of an invasion. During 1869, it is a remarkable fact, that the influences invading from Ganjam southward, stopped abruptly somewhere in the Vizagapatam District, the southern boundary of which was not overstepped as will be seen in the following table :—

Cholera in Northern Districts, 1869.

Districts.	Ganjam.	Vizagapatam.	Godavery.	Kistna.
Population for which returns were received.	10,68,992	10,79,926	14,27,472	12,46,852
Total Deaths.	16,437	22,226	31,939	22,656
Cholera Deaths.	981	567	...	3
January	17	26	...	...
February	14	6	...	...
March	58	11	...	3
April	55	10	...	...
May	25	13	...	...
June	160	37	...	...
July	299	185	...	...
August	199	122	...	...
September	109	72	...	...
October	9	53	...	...
November	16	28	...	...
December	20	4	...	...

Exemption of Godavery and Kistna Districts both in 1868 and 1869.

The Godavery and Kistna Districts had been practically exempt from cholera for the whole of 1868 as well as 1869. It is true that the death registers for 1868 show a total of six deaths in the Godavery District from cholera. These are stated to have occurred in January and February. The Kistna District shows twenty-one cholera deaths in 1868 scattered through the year, and here again it is necessary to bear in mind that these scattered and isolated cases may have been either incorrectly reported, or due to so called endemic influences of the coast line.

Recapitulation.

59. We have seen, then, in 1869, cholera pressing steadily to the southward; advancing from the Kistna river to the valley of the Cauvery, where it lay in strength at the end of the year.

In this southern advance it passed very lightly over the whole of the country below the ghauts in Western India, and on the east, it passed by, and left untouched, the districts of the Godavery and Kistna. Cholera, in trying to advance from the endemic field in Ganjam to the south, was stopped short in the next district, Vizagapatam. The year was not one of any great mortality, considering that it was a year of invasion. The registered deaths numbered only 21,602, and the following table will illustrate the monthly prevalence in each district :—

Table showing Cholera Deaths in 1869.

Districts.	Population for which returns were received.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Ganjam ...	10,68,992	17	14	58	55	25	160	299	199	109	9	16	20	981
Vizagapatam.	10,79,926	26	6	11	10	13	37	185	122	72	53	28	4	567
Godavery ...	14,27,472	...	...	...	...	...	...	...	...	...	...	...	...	...
Kistna ...	12,46,852	...	...	3	...	...	...	...	...	...	...	...	...	3
Nellore ...	11,34,757	...	...	...	...	3	2	154	219	358	173	39	106	1,054
Cuddapah ...	11,44,759	12	5	18	8	7	96	715	533	363	68	8	6	1,859
Bellary ...	12,57,147	...	...	10	1	258	1,219	1,295	532	87	22	...	...	3,424
Kurnool ...	7,70,857	52	50	203	240	103	709	1,045	305	41	64	5	...	2,817
Madras ...	8,04,283	...	...	...	...	...	...	90	37	71	83	121	154	1,559
Madras town	4,50,000	...	...	...	2	5	5	80	229	147	73	16	11	568
North Arcot.	17,75,506	3	...	5	...	2	86	705	339	549	447	213	256	2,605
South Arcot.	10,92,958	4	2	1	3	5	4	14	3	27	31	63	393	544
Tanjore ...	17,31,703	19	18	16	13	13	26	13	138	281	542	1,258	2,226	4,563
Trichinopoly	9,90,037	6	7	4	4	...	6	...	8	6	7	69	405	522
Madura ...	19,46,389	4	10	2	8	4	7	5	8	6	2	3	13	72
Tinnevelly ...	10,82,301	5	7	12	4	5	9	7	5	5	3	9	9	80
Coimbatore ..	13,93,582	2	...	...	1	1	1	4	3	8	64	60	60	204
Salem ...	16,19,233	4	3	3	17	...	2	2	...	20	36	129	81	297
South Canara	8,36,019	18	30	11	15	5	9	13	8	14	33	19	9	184
Malabar ...	18,49,671	...	3	19	19	18	5	1	13	32	9	9	...	131

CHAPTER IV.

THE CHOLERA OF 1870.

Activity of Cholera in South Arcot, Trichinopoly, and Tanjore Districts in the beginning of the year.

60. We found cholera at the end of the year 1869 vigorous in action in the South Arcot, Trichinopoly, and Tanjore Districts. Before tracing its advance southward, it will be necessary to take a brief survey of its ravages in these districts during the early part of 1870. The following table will show the monthly deaths, and the progressive southern movement of the epidemic to the districts of Madura and Tinnevelly:—

Deaths from Cholera in the Southern Districts, during 1870.

Districts	South Arcot.	Tanjore.	Trichinopoly.	Madura.*	Tinnevelly.
Population for which returns were received.	12,61,846	17,31,703	9,90,037	19,01,774	13,10,117
Total Cholera Deaths.	3,248	6,584	2,557	5,638	7,611
January	617	3,708	960	18	8
February	246	1,119	344	70	46
March	150	216	192	323	258
April	118	218	122	275	637
May	238	175	7	307	1,721
June	300	392	14	53	1,911
July	687	357	44	621	1,246
August	574	176	65	1,445	626
September	176	110	103	932	398
October	88	45	28	462	142
November	38	18	139	330	45
December	16	50	539	324	573

This table illustrates the intensity of the epidemic in all the three districts where cholera was in force at the end of 1869, and during January 1870, and its rather sudden declension in them after that month. In May there was a considerable accession of cholera in the South Arcot District, and in the following month there was some renewal of activity in Tanjore, but in the Trichinopoly District the renewal was less marked. The contiguity of these districts to the pilgrim sites of Triputty and Conjeveram must be borne in view, in relation to the reproduction at this somewhat unusual season of the year. In South Arcot and Tanjore the epidemic had nearly died out at the end of 1870, but there had been a normal seasonal reproduction in Trichinopoly, in November and December.

More Cholera in irrigated than in dry upland talooks.

61. Trichinopoly District.—The following table shows the degree in which each talook was affected. It will be noticed that the Municipal Town of Trichinopoly and the Trichinopoly Talook suffered more in proportion than any other part of the district, during the first three months of the year when cholera was in motion. Out of 613 villages cholera prevailed in 117, during the month of January. The dry upland districts of Perambalore and Kulutalli were the least affected. Only 11 and 13 villages out of 314 and 1,303 respectively being affected, during the month, of greatest prevalence. The Trichinopoly Talook, which is very extensively watered by irrigation channels, suffered, apparently, in proportion to the degree of moisture in its soil:—

*Exclusive of Zemindaries.

Table showing Deaths by Cholera in the several Talooks, &c., of the Trichinopoly District in each month of the year 1870.

——	Perambalore Talook, N. of District.			Wodiarpolliem Talook, N. E. of District.			Municipal Town, Trichinopoly, Centre of Talook.		Trichinopoly Talook, S. E. of District.			Kulutalli Talook, S. W. of District.			Museri Talook, W. of District.		
Population ...	144,072			190,204			55,730		199,667			190,880			226,273		
Total No. of Villages in each Circle... ...	314			596			——		613			1,303			526		
Months.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.
January	11	13,515	58	24	20,019	100		219	117	76,383	435	15	18,278	50	33	45,827	98
February	13	12,198	73	4	4,155	11		62	52	44,792	130	7	9,205	28	11	10,579	40
March	7	4,416	27	2	5,752	2		5	20	23,717	44	22	26,257	81	5	6,286	33
April	6	4,663	17	3	3,889	21		...	9	7,710	21	15	20,773	58	3	3,718	5
May	...	...	...	...	...	...		...	4	4,197	5	1	395	1	1	83	1
June	1	656	1	3	3,233	11	55,730	...	1	1,519	1	1	3,665	1	...	...	...
July	7	10,042	7	12	10,533	19		2	7	14,082	7	4	2,563	4	4	5,962	5
August	1	1,563	1	7	5,973	36		...	6	3,965	7	4	4,791	20	1	2,567	1
September	13	12,897	43	9	6,095	23		1	11	18,705	11	7	6,860	16	5	4,995	9
October	4	3,114	4	7	3,956	9		...	10	10,158	10	3	6,233	4	1	456	1
November	3	3,254	5	3	2,559	4		...	6	11,747	6	7	8,376	15	17	21,574	109
December	3	3,347	4	5	2,160	6		41	40	73,914	106	18	25,856	61	35	44,096	321
Total...	-	——	240	-	——	242	——	330	—	——	783	-	——	339	-	——	623

The total cholera deaths in the district were 2,557, and these were distributed over the several populations according to the following ratios :—

Table showing Proportion of Cholera Deaths to 1,000 *of Population in each Talook, &c., of the Trichinopoly District, during the year* 1870.

Municipal Towns and Talooks.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Perambalore Talook	0·4	0·5	0·1	0·1	...	0·006	0·04	0·006	0·2	0·02	0·03	0·02	1·6
Wodiarpollium ,, ...	0·5	0·05	0·01	0·1	...	0·05	0·09	0·1	0·1	0·04	0·02	0·03	1·2
Municipal Town, Trichinopoly	3·9	1·1	0·09	...	...	...	0·03	...	0·01	...	...	0·7	5·09
Trichinopoly Talook	2·1	0·6	0·2	0·1	0·02	0·005	0·03	0·03	0·05	0·05	0·03	0·5	3·9
Kulutalli ,, ...	0·2	0·1	0·4	0·3	0·005	0·005	0·02	0·1	0·08	0·02	0·07	0·3	1·7
Museri ,, ...	0·4	0·1	0·1	0·02	0·004	...	0·02	0·004	0·04	0·004	0·4	0·1	2·7

Sreerungum festival.

62. The seasonal reproduction of cholera began in the Museri Talook in November, and the largest mortality occurred in this talook, during the season of re-production. Some deaths occurred at the Sreerungum festival in December; and the disease extended to the town and cantonment of Trichinopoly in December, but the disease was nowhere severe at the end of the year. The number of persons attending the annual festival at Sreerungum was much less than is customary.

I had taken the precaution of warning the Collector that the appearance of cholera in the Museri Talook in November was likely to endanger the lives of persons at Sreerungum; and, acting on this information, the Collector was able to warn the people of the district of the risk of attending the festival. Not more than 20,000 persons assembled on this occasion. Some individuals from

Hyderabad, however, in marching back through the Kurnool District in January 1871, suffered from cholera, and communicated it to several villages in which they had encamped. This party had travelled from Trichinopoly to Ghooty by railway. The Kurnool District, until this outbreak, had been absolutely free of cholera for more than eighteen months.

63. TANJORE.—As in the Trichinopoly District, the various talooks were not equally affected by the cholera epidemic. The talook of Combaconum suffered more than any others, and this particular talook includes some of the most plentifully watered lands in the whole district. In the month of January two-thirds of the population of this talook were exposed to cholera influences, while in other talooks the proportion was generally much less. The talooks of Tanjore, Negapatam and Manargoody, also well-watered districts, had a heavy cholera mortality. The Municipal town of Combaconum had cholera deaths in every month of the year; the situation of the town, between two great branches of the Cauvery river, and the fact that the sub-soil water of the whole country rises and falls with the streams, would, according to Pettenkofer, yield the necessary conditions for the development of cholera. Observations are now being made in this locality to register the rise and fall of such sub-soil water, in connexion with the mortality from cholera. The total deaths in the district were 4,563, and the proportion of cholera mortality to population in the various registration circles was as follows :—

Table showing Proportion of Cholera Deaths to 1,000 *of Population in each Talook, &c., of the Tanjore District, in each month of the year* 1870.

Municipal Towns and Talooks.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Sheally Talook	0·4	0·1	0·1	0·01	0·05	0·8	0·3	0·1	0·01	0·02	0·01	0·02	2·1
Municipal Town, Mayaveram	2·7	0·4	0·05	0·05	0·05	0·2	1·4	0·1	...	0·05	...	...	5·1
Mayaveram Talook	1·04	0·1	0·03	0·02	0·05	0·1	0·3	0·1	0·06	0·005	...	...	1·9
Nunnillum „	2·7	0·5	0·03	0·1	0·09	0·04	0·09	0·1	0·04	0·03	0·01	...	3·9
Municipal town, Negapatam.	0·5	0·1	0·03	...	0·03	0·1	0·9	0·9	0·4	...	...	...	3·2
Negapatam Talook	1·5	0·6	0·1	0·1	0·2	0·1	0·7	0·2	0·1	0·05	0·03	0·007	5·2
Tritrapundy „	1·4	0·2	0·02	...	0·08	0·3	0·3	0·09	0·2	0·05	...	0·07	2·9
Pattucottah „	0·2	0·2	0·09	0·05	0·005	0·03	0·09	0·04	0·03	0·01	0·01	...	0·8
Municipal Town, Tanjore ...	1·5	0·6	0·2	0·02	0·05	...	...	...	...	...	...	..	2·5
Tanjore Talook	2·4	1·2	0·3	0·3	0·03	0·04	0·003	0·02	0·02	0·03	0·01	0·12	4·6
Municipal Town, Combaconum	3·005	0·6	...	0·03	0·06	0·03	0·1	0·1	0·03	0·06	0·03	0·03	4·2
Cumbaconum Talook	4·4	1·06	0·1	0·1	0·04	0·02	0·04	0·03	0·02	0·02	0·01	0·01	5·9
Municipal Town, Manargoody	0·8	1·7	...	...	0·2	0·1	0·1	...	...	...	...	...	2·9
Manargoody Talook	3·04	0·6	0·1	0·2	0·5	0·2	0·1	0·02	0·07	0·007	...	...	5·09

Table showing particulars of Deaths by Cholera in the several Talooks, &c., of the District of Tanjore, during each month of the year 1870.

——	Sheally Talook, North of District.			Municipal Town, Mayaveram, North of Talook.		Mayaveram Talook, North of District.			Nunnillam Talook, East of District.			Municipal Town, Negapatam, East of Talook.		Negapatam Talook, East of District.			Tritrapundy Talook, South-East of District.		
Population...	97,045			17,025		176,827			190,940			33,095		132,706			128,336		
Total No. of Villages in each Circle ...	450			——		808			959			——		650			419		
Months.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.
January	18	10,271	45		47	61	47,089	184	142	87,683	525		19	39	33,820	211	52	33,382	183
February	4	4,211	18		7	12	13,745	24	34	23,209	102		4	17	20,425	90	8	4,178	30
March	4	4,176	13		1	4	3,451	6	5	2,481	7		1	4	9,066	24	3	935	3
April	1	1,084	1		1	2	631	4	8	6,162	27		...	7	10,676	22	...	...	...
May	4	2,129	5		1	3	3,374	9	6	5,818	19		1	9	3,114	33	3	2,617	11
June	26	18,040	82	17,025	4	12	7,791	20	6	2,294	8	33,095	4	33	17,609	158	15	11,850	51
July	12	11,989	31		24	22	21,080	64	7	4,419	19		33	29	18,473	95	13	10,053	39
August	9	6,967	11		2	13	16,818	30	13	6,400	25		32	11	5,036	30	4	1,465	12
September	1	147	1		...	8	6,917	11	7	7,991	9		15	2	2,262	17	10	9,213	26
October	2	879	2		1	1	800	1	2	629	6		...	2	3,107	7	5	7,235	7
November	1	371	1		...	...	...	...	2	757	2		...	2	1,247	5	...	...	...
December	1	912	2		...	...	...	...	...	...	...		...	1	330	1	3	1,167	9
Total...	—	——	212	——	88	—	——	353	—	——	749	——	109	—	——	693	—	——	371

Table showing particulars of Deaths by Cholera in the several Talooks, &c., of the District of Tanjore, during each month of the year 1870.—(Continued.)

———	Pattucottah Talook, South of District.			Municipal Town, Tanjore, North of Talook.		Tanjore Talook, West of District.			Municipal Town, Combaconum, East of Talook.		Combaconum Talook, North-West of District.			Municipal Town, Mannargudy, Centre of Talook.		Mannargudy Talook, Centre of District.		
Population...	196,960			36,941		263,867			29,283		280,901			19,447		128,330		
Total No. of Villages in each Circle ...	1,270			———		853			———		1,109			———		605		
Months.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.
January	16	9,714	41		58	120	11,536	649		88	268	1,83,385	1251		16	97	51,296	391
February	13	12,247	44		25	75	82,508	342		18	102	88,920	298		34	30	37,704	81
March	10	5,579	19		10	27	32,990	80		...	20	16,964	37		...	11	10,083	15
April	3	1,719	11		1	19	25,879	83		1	10	9,639	33		...	9	4,902	34
May	1	1,559	1		2	6	7,473	8		2	7	2,606	12		4	15	8,733	67
June	5	2,849	6	36,941	...	7	8,782	11	29,283	1	7	9,330	7	19,447	2	17	7,932	38
July	6	6,246	19		...	1	384	1		3	9	6,493	13		2	5	2,421	14
August	4	2,335	9		...	7	12,366	7		5	7	8,573	10		...	3	941	3
September	3	1,305	7		...	5	3,164	7		1	5	2,901	6		...	3	1,482	10
October	3	3,321	3		...	6	6,458	9		2	3	2,095	6		...	1	1,384	1
November	1	73	3		...	3	4,190	3		1	3	1,438	3		...	...	...	...
December	...	...	...		...	16	18,236	33		1	2	933	4		...	...	...	...
Total...	—	———	165	———	96	—	———	1233	———	123	—	———	1680	———	58	—	———	654

64. SOUTH ARCOT DISTRICT.—The table of the registration circles of this district shows a large preponderance of deaths in the Chellumbrum Talook, where cholera began to revive in force in the month of June. I cannot but suspect that the renewal of cholera in the district, at that season of the year, was due to the return south-ward of cholera-stricken pilgrims from Conjeeveram. Chellumbrum is one of the great places of pilgrimage in the district, and it is evident that the population of this talook suffered unduly after the return of pilgrims from Conjeeveram. At the end of the year cholera had quite died out, as an epidemic, in the district. The total deaths were 3,248, and the proportion of mortality to population in the several talooks and registration circles was as follows :—

Table showing the proportion of Deaths by Cholera in the several Talooks, &c., of the District of South Arcot, during each month of the year 1870.

Municipal Towns and Talooks.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Trinomalay Talook ...	0·009	0·009	...	...	0·82	0·19	0·04	0·17	...	...	0·009	...	1·2
Tindevenum „ ...	0·29	0·07	...	...	0·56	0·506	0·07	0·14	0·06	...	...	...	1·7
Villapooram „ ...	0·35	0·14	0·05	0·009	0·209	0·22	0·39	0·14	0·08	0·009	0·03	...	1·6
Cuddalore Municipal Town.	0·14	0·24	...	...	0·035	0·14	0·56	0·24	0·07	0·035	...	...	1·4
Cuddalore Talook ...	0·85	0·13	0·103	0·02	0·02	0·35	0·44	3·32	0·09	0·103	0·02	...	2·5
Chellumbrum „ ...	0·95	0·38	0·13	0·12	0·02	0·13	2·11	1·49	0·19	0·15	0·13	0·02	5·7
Virdachellum „ ...	0·504	0·206	0·109	0·27	0·03	0·04	0·21	0·51	0·206	0·02	...	0·02	2·1
Kullakoorchy „ ...	0·64	0·31	0·43	0·09	...	...	0·06	0·21	0·18	0·02	...	0·03	2·01
Trikovilloor „ ...	0·6	0·24	0·19	0·25	0·04	0·403	0·48	0·501	0·29	0·23	0·01	0·02	2·7

The table on the next page gives the particulars as to the incidence of cholera in the different divisions of the district.

Table showing particulars of Deaths by Cholera in each Talook, &c., of the District of South Arcot, during each month of the year 1870.

Talooks, &c.	Trinomalay Talook, North of district.			Tindevenam Talook, North of district.			Villapooram Talook, North-East of district.		
Population.	1,01,473			1,63,752			2,00,404		
Total No. of Villages in each Circle.	601			610			547		
Months.	No. of villages affected.	Population.	Cholera deaths.	No. of villages affected.	Population.	Cholera deaths.	No. of villages affected.	Population.	Cholera deaths.
January	1	6,073	1	13	11,092	49	26	24,181	72
February	1	318	1	7	4,125	12	7	8,088	29
March	...	...	...	...	...	...	4	4,131	11
April	...	...	...	...	...	...	2	2,085	2
May	11	4,584	84	25	16,949	92	17	18,578	42
June	2	632	20	25	19,163	83	13	10,813	45
July	4	7,950	5	5	1,992	12	15	14,528	80
August	12	3,995	18	8	9,135	23	10	7,293	21
September	...	...	...	4	6,203	10	7	5,173	17
October	...	...	...	...	...	...	2	1,249	2
November	1	1,070	1	...	...	...	3	3,825	7
December	...	...	...	...	...	...	...	...	...
Total...	—	——	130	—	——	281	—	——	328

Talooks, &c.	Municipal Town, Cuddalore, East of Talook.			Cuddalore Talook East of district.			Chillumbrum Talook, South-East of district.		
Population.	28,421			1,73,568			1,84,044		
Total No. of Villages in each Circle.	——			558			608		
Months.	No. of villages affected.	Population.	Cholera deaths.	No. of villages affected.	Population.	Cholera deaths.	No. of villages affected.	Population.	Cholera deaths.
January	...		4	45	86,190	149	47	57,236	176
February	...		7	13	17,423	23	21	34,806	71
March	...		...	10	18,443	18	15	32,853	25
April	...		...	4	2,155	5	5	8,218	23
May	...		1	4	2,525	4	4	2,624	4
June	...		4	7	13,382	62	7	4,853	25
July	...	28,421	16	20	26,188	78	55	59,170	389
August	...		7	20	21,610	57	73	74,392	275
September	...		2	9	8,982	16	12	12,885	36
October	...		1	6	7,934	18	10	19,070	28
November	...		...	3	2,536	4	6	5,001	24
December	...		...	...	...	...	4	2,792	4
Total...	—	——	42	—	——	434	—	——	1080

Talooks, &c.	Virdachellum Talook, South-East of district.			Kullakoorchy Talook, South-West of district.			Trikovilloor Talook, Centre of district.		
Population.	1,54,718			1,21,857			1,33,609		
Total No. of Villages in each Circle.	419			347			443		
Months.	No. of villages affected.	Population.	Cholera deaths.	No. of villages affected.	Population.	Cholera deaths.	No. of villages affected.	Population.	Cholera deaths.
January	20	22,859	78	19	19,758	79	5	3,966	9
February	14	14,657	32	12	11,390	38	4	1,944	33
March	7	12 404	17	10	13,223	53	7	4,202	26
April	7	4,309	42	5	2,364	12	3	2,767	34
May	2	2,778	5	...	...	...	4	3,046	6
June	3	4,210	7	...	...	...	21	14,442	54
July	11	11 446	34	2	586	8	22	12,379	65
August	12	7,942	79	11	4,815	26	27	19,394	68
September	13	11,403	32	10	7,019	23	13	13,569	40
October	3	2,659	4	3	1,217	3	7	5,528	32
November	...	...	...	...	...	...	1	952	2
December	2	1,031	4	4	2,604	4	3	1,846	4
Total...	—	——	334	—	——	246	—	——	373

CHOLERA INVASION OF THE MADURA DISTRICT.

Outbreak at the Pulney feast in the middle of March.

65. By the aid of the District Police, early intelligence was conveyed to the Sanitary Commissioner of the movement of cholera towards Madura. Scattered cases had begun to occur early in January; and in the Pulney Talook the first reported death occurred on the 15th February. The Pulney festival took place from the 16th to the 25th of March, and was attended by about 20,000 persons. Cholera broke out in rather a virulent form amongst these people, when they immediately began to break up and disperse over the country. Sixteen deaths from the 16th to the 22nd were reported by the Police, and the Revenue officials note twenty-six cases, but it is evident that a great number must have escaped observation. After the dispersion of these persons, the report of cholera deaths in the neighbouring villages, and along the high roads into other districts became more numerous.

Extension of cholera to towns and villages in the neighbourhood.

This will be better seen in the following extract from the daily register of deaths reported by the Police :—

Districts.	Towns and Villages.	Population.	Dates of Cholera Deaths, March 1870.																															Total.
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Madura.	Madura town...	39,872	...	3	1	2	...	...	2	...	...	1	...	3	...	3	...	2	2	1	...	...	...	...	...	1	1	...	1	2	...	1	3	29
	Teeruoor 12 miles north of Pulney ...	2,125	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
	Pulney	10,895	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	4	...	...	2	1	3	...	...	...	...	...	...	...	...	...	13
	Chutraputty ...	1,300	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	3	...	...	...	6
	Tondy	3,300	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...	3
	Triparagoodu, 4 miles south-west of Madura	2,891	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1
	Oosalamputty...	1,000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	4	8	9	10	3	6	43
	Dindigul... ...	8,951	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
	Batlagoondu, 6 miles west of Nellacottah ..	5,500	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2
	Vadasundoor ...	700	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	3	...	...	...	...	...	...	...	...	...	...	...	5
	Mailore	1,100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
	Ramnad	1,2000	...	...	...	...	...	...	...	...	...	From 20th to 25th 15 cholera deaths were reported.																						15
	Total...	...	...	3	1	2	...	...	2	...	...	1	...	3	...	4	...	6	6	3	2	5	1	3	4	5	2	5	10	14	10	4	9	120
Coimbatore.	Bhowany ...	4,891	...	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	6
	Sattiamangalum	2,446	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2	...	...	4
	Erode	5,022	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2
	Darapoorum ...	3,489	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	1	4	1	...	...	...	9
	Vardampalliem, ½ mile north of Sattiamangalum	1,039	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
	Oothiyoor ...	126	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
	Total...	...	...	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	1	3	...	3	5	1	3	...	2	23

First case in the town of Madura.

66. Captain Guthrie, Superintendent of Police, notes that the first case in Madura was a Salem cart driver *en route* from Tondy on the east coast to Salem. Cholera was prevailing at Tondy after 18th February. The first case in the town of Madura was reported on 25th February. The disease was very fatal in a small village "Oosalumputty," 24 miles away, during March, no fewer than forty deaths, out of a population of 1,000, having occurred in a few days. Captain Guthrie says of this village that the disease was caught in Madura, but the detailed evidence is not recorded. The facts in regard to this village and the cholera at Pulney were notified by me to the

Magistrate of the district; and, as the large Chittra festival at Madura was approaching, it was suggested that special sanitary care should be taken to preserve the public health. In my letter to the Collector, dated 2nd April, I remarked, "I do not apprehend any general outbreak of cholera during the approaching festival (in May), as this is not the season in which the disease is apt to prevail epidemically in your district." This prediction turned out to be quite correct. Captain Guthrie notes that during the Chittra feast, when the town was enormously crowded, cholera was not prevalent; indeed, for four days there was not a single case. The Chittra feast occurs in May during the hottest and driest period of the year, and before the arrival of the south-west monsoon, the moisture of which is thought to be essential to the general spread of cholera. (I shall note, however, in regard to the Tinnevelly District, that the absence of monsoon moisture was no obstacle to the spread of cholera in the dry season of that district.)

Cholera in abeyance in Madura during the Chittra festival in May.

67. All through May and June cholera continued to appear in a few places, and in July it became located in the Cumbum valley, and was very prevalent and fatal in the town of Cumbum, from the 24th of June. Captain Guthrie, the Superintendent of Police of the district, who has taken great pains to investigate the progress of cholera, and who has obligingly furnished me with the following memorandum, detailing his own views as to increase of cholera in the district after July, was of opinion that the intensity of the disease had been aggravated by the landing of return emigrants from Ceylon with cholera, at Davipatam; but on reviewing the whole facts of the case, I am not inclined to think that this is a sufficient explanation of the intensity of the cholera in the districts lying at the base of the Pulney mountains.

Cholera in the Cumbum valley.

MEMORANDUM.

"Cholera made its first appearance in the Madura District in the south-eastern or Zemindary portion in January, and the first death was recorded at Shevagunga of a man who had come up from the coast near Ramnad (village not known); not many days after a case occurred in Madura town. The man attacked was a bandyman belonging to Salem District, who, along with the others, was *en route* from Shevagunga to Salem. He died. About twelve days after this it became well developed at Tondy on the coast, the first case being that of a man who had come from Davipatam, nine miles from Ramnad, the shipping station for Ceylon coolies during the south-west monsoon. Later by a week (in February) the deaths in Madura town became frequent and daily, and by the end of the month Tondy had reported eight and Madura town sixteen deaths.

Captain Guthrie's Memorandum.

"One death happened in Pulney on the 15th February, the victim being a stranger from Coimbatore or Salem; and from that time one death only occurred up to the annual festival there, when seven deaths were registered between 14th and 18th March, and the legacy continued to leave its mark up to the end of the month, when it ceased. Deaths registered twenty.

"Almost simultaneously with the appearance of cholera at Pulney, several cases were reported at Chuthraputty (ten miles east of Pulney) on the road from Madura to Pulney; and I have no doubt it found its way there from Madura and by means of cartmen proceeding to Coimbatore District through Pulney, which is the regular route; the first persons when seized were so travelling.

"Till the end of March it was confined to Madura town, Tondy, and Pulney; but it then appeared almost in the same day at Tiruparagoondum, four miles south of Madura on the Tinnevelly road, at Dindigul, at Oosslumputty, twenty-four miles west of Madura on the short road to the Cumbum valley (Pereacolum Talook) and at Nellacottah and Battlagundu on the main road to Pereacolum. A case also occurred at Mailore, eighteen miles north-east of Madura, on the road to Trichinopoly,

which was carried up from Madura and thence on to Keelavalavoo, a small village six miles west of Mailore. It also broke out at Ramnad on the 20th March, and in five days fifteen deaths were registered.

"From Nellacotta and Buttlagundu the disease was carried on by travellers and bandymen, along the main road, to Pereacolum, and from thence diffused all over the talook, which is not quite free from it yet, and has suffered very much. 213 deaths were registered up to the end of June, and 184 from July to end of November (in all 397 since April 18th).

"In April only six deaths took place in Madura town, and in May six, the last being on the 24th, and from that date it ceased in the town.

"It held very slightly to Mailore and Keelavalavoo in April, and four cases occurred at Oosslumputty early in the month; the only portion of the district which suffered in that month being the Pereacolum Talook.

"In May it was confined to Madura town and Pereacolum Talook with one death in Dindigul, but *towards the end* of June it broke out afresh in the Zemindaries almost simultaneously at Shevagunga and Teruvandani, and Tondy again within a few days.

"As far as I have been able to trace this new outbreak it appears to have been undoubtedly introduced by return coolies from Ceylon, six of whom died on board ship at Davipatam or immediately on being landed.

"The Ceylon Government have a Native Doctor and Hospital at Davipatam.

"From this centre in July cholera spread in lines clearly traced by the various main roads throughout the Zemindaries of Ramnad and Shevagunga, penetrating on both sides to the borders of the district adjoining Tondiman in the north and Tinnevelly in the south, while by the main road from Davipatam and Ramnad it entered Madura town again on the 9th of August when two pilgrims died. Thence the main wave of the disease spread northward in the Mailore Talook, which, in company with the Zemindaries, suffered a great deal in August.

"One or two isolated cases occurred at Pulney and Dindigul, but the disease seemed to fix itself to the filthiest localities in Mailore Talook, Shevagunga, and Ramnad Zemindaries and Pereacolum Talook.

"In August 100 deaths were registered from Mailore Talook, and in September eighty-eight, after which it ceased there. In July and August the Ramnad or Southern Zemindary reported 278 deaths, while the Northern Shevagunga gave thirty-seven only.

"In Madura town 142 deaths occurred in August and fifty-three in September. Ramnad town suffered most in September with a few cases in Pulney Talook, while the disease still clung to the Pereacolum Talook; but in October it suddenly increased, and with new impulse seized on Ramnad where seventy-two deaths were reported against thirty in September. The other parts of this Zemindary gave fourteen deaths in September and 130 in October and November; in the latter month the disease appears to have told chiefly in the port of Keelacurrai, south of Ramnad nine miles, and may be accounted for by the change of monsoon to north-east, when the place is in almost daily communication with Ceylon, where, I believe, cholera has been somewhat severe.

"The whole number of deaths for the district, reported from January to 30th November, amounts to 1,847; but this is not accurate, because in the early part of the year only deaths at Police Stations were given, and it was not till the end of July that reports were received from villages generally.

"As a general principle cholera has been worst where most filth exists. At one place, Keeranoor, where most deaths occurred in the Pulney Talook, the filth close to the houses around the village is something beyond conception, and in the Pereacolum Talook fully one-half of the area of each village is taken up for cattle pens, which are open to the weather, and a perfect mass of filth, fresh as well as putrid, while every open space close to the village is thoroughly saturated with urine and droppings of cattle and sheep. I consider this fully accounts for the pertinacity with which cholera has stuck to this particular talook, especially when taken in conjunction with frequent showers of rain.

"Rain and sun in the dirty villages of Mailore Talook, and the Zemindary of Ramnad have also, I consider, caused the disease to take more firm hold than it otherwise would when the drier parts of the district have not suffered so much."

P.S.—"Pilgrims to Ramisseram have not suffered much; indeed at Paumben they had no cholera, and Ramisseram itself was said to be free from it. (I have been there and made inquiries.)

"The pilgrims from the North-West Provinces of India are usually very healthy; it is the people from the Western Coast and Travancore who suffer from disease and usually multiply cholera when it does break out. The North-West Province men eat fish, whereas the West Coast Brahmins do not, and are also much dirtier in their habits, and whole meals of uncooked and unripe vegetables must tell upon them."

68. This report of Captain Guthrie is very interesting as regards the insanitary conditions co-existing with the intensity of cholera. I shall have to allude to it again hereafter. As regards the influence of return emigrants from Ceylon, it is quite clear that cholera was raging in the Cumbum Valley before they landed at Davipatam, and although some impetus might have been given to the virulence of cholera by the return emigrants, they cannot be charged with affecting the district. The Cumbum Valley has certain geographical peculiarities. It lies between the Pulney Hills and the mountain chain dividing Madura from the country of Travancore, and being surrounded on all sides, but the east, by hills and mountains, the cholera influence, when it once gets into such a locality, seems to have a great difficulty in getting out again. It seems certain, from the general spread of cholera, that it advanced in the first instance southward from the Madura District either along the coast or through the Ramnad Zemindary, or by the road from Madura, to Tinnevelly, and that the cholera influence getting into the *cul-de-sac* of the Cumbum Valley, and being unable to cross the mountain barrier, was forced to expend its chief strength in this locality. A reference to the accompanying Cholera map will enable the reader to comprehend the peculiar position of the Cumbum Valley. It is worthy of notice that the villages on the Pulney Hills suffered very severely this year from cholera. I have been informed by Mr. J. R. Arbuthnott, the Sub-Collector of the district, that cholera continued to prevail for several months on the Hills, after the return of the Hill residents from the Pulney festival in March.

Geographical peculiarities of the Cumbum Valley favouring the retention of cholera.

Cholera on the Pulney Hills.

In the following table will be found the particulars of the several talooks and their cholera mortality in each month of the year. The total mortality in the district was 5,638, and the proportion of deaths to population in each talook is given below. Up to the date of going to Press, no returns had been received showing the actual mortality in the Ramnad and Shevagunga Zemindaries, so that the table exhibits only the cholera mortality of a portion of the population of the district.

Table showing Deaths by Cholera in the several Talooks, &c., of the District of Madura in each month of the year 1870.

	Municipal Town, Dindigul, Centre of Talook.		Dindigul Talook, North of District.			Mailore Talook, North of District.			Municipal Town, Madura, Centre of District.		Madura Talook, Centre of District.			Teroomungalum Talook, South of District.			Pereacolum Talook, South-West of District.			Pulney Talook, North-West of District.			Shevagunga Zemindary.			Ramnad Zemindary.		
Population ...	8,951		2,65,432			1,12,983			39,872		1,62,912			2,14,840			1,80,187			1,61,534			—			—		
Total Number of Villages in each Circle ...	—		1,724			551			—		687			898			503			546			3,039			3,079		
Months.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.	No. of Villages affected.	Population.	Cholera Deaths.
January		...	1	3,094	1	2	7,234	2		*	3	2,269	4	7	5,274	10	...	...	...	1	302	1						
February		...	...	...	...	5	9,509	11		16	7	5,244	29	3	2,710	5	...	...	...	4	17,094	9						
March		3	20	43,475	77	11	21,789	20		*	5	6,187	35	22	39,489	60	4	19,533	10	38	81,617	118						
April		3	17	20,345	34	11	22,617	28		6	13	18,129	25	27	41,893	119	2	15,458	3	14	27,131	57						
May		...	8	27,521	14	3	8,425	17		4	18	18,860	32	32	36,999	93	16	79,061	133	5	11,251	14						
June		...	19	29,233	64	6	13,235	65		2	8	10,754	32	42	54,687	184	16	68,653	95	5	6,882	89		No returns received.				
July	8,951	1	13	38,397	53	...	...	...	39,872	2	6	9,692	10	43	70,176	113	35	1,10,877	431	3	5,612	11						
August		6	32	76,314	175	47	87,439	319		160	66	60,990	201	41	71,758	119	48	1,47,477	446	6	21,782	19						
September ...		16	32	51,234	113	21	47,481	119		120	49	55,958	168	49	78,195	126	30	1,07,562	169	10	28,828	101						
October		4	21	37,619	75	2	5,317	6		19	21	21,156	69	23	42,624	73	17	44,817	205	4	5,154	11						
November... ...		...	18	47,293	47	4	5,609	6		9	20	25,258	61	20	33,661	61	19	53,383	145	1	1,314	1						
December		15	15	22,282	28	10	27,992	26		38	32	27,041	88	16	31,160	27	11	22,058	58	6	17,355	44						
Total...	—	48	—	—	681	—	—	619	—	376	—	—	754	—	—	990	—	—	1695	—	—	475						

* No returns received.

Table showing Proportion of Cholera Deaths per 1,000 *of Population in each Talook, &c., of the District of Madura during the year* 1870.

Municipal Towns and Talooks.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Municipal Town, Dindigul	...	...	0·3	0·3	...	...	0·1	0·6	1·7	0·4	...	1·6	5·3
Dindigul Talook ...	0·003	...	0·2	0·1	0·05	0·2	0·1	0·6	0·4	0·2	0·1	0·1	2·5
Mailore „ ...	0·01	0·09	0·1	0·2	0·1	0·5	...	0·2	0·1	0·05	0·05	0·2	5·4
Municipal town, Madura	...	0·4	0·1	...	0·1	0·05	0·05	4·01	3·009	0·5	0·2	0·9	9·4
Madura Talook ...	0·02	0·1	0·2	0·1	0·1	0·1	0·06	1·2	1·03	0·4	0·3	0·5	4·6
Teroomungalum Talook	0·03	0·01	0·1	0·1	0·1	0·1	0·2	0·1	0·2	0·1	0·2	0·1	4·6
Pereacolum Talook ...	...	...	0·05	0·01	0·7	0·5	2·3	2·4	0·9	1·1	0·8	0·3	9·4
Pulny Talook ...	0·006	0·05	0·7	0·3	0·08	0·5	0·06	0·1	0·6	0·06	0·006	0·2	2·9
Ramnad Zemindary } Shevagunga „ }				No returns received.									

Inspection of Madura by Sanitary Commissioner.

69. In the course of my tour through the South of India I paid a visit to the town of Madura, and arrived there on 26th August, when cholera was still prevailing epidemically. I do not know any place, with the exception of Salem, which is better calculated to retain cholera. The town stands on the right bank of the Vigay river, a stream that has a broad sandy bed, and usually only one or two rills of water on the surface, though after heavy rain it becomes a deep and rapid stream. The soil on which the town stands is a rich chocolate alluvial, with a good deal of clay in it, and appears to be remarkably fertile. The town itself is of considerable antiquity, and until recently was enclosed by fortified walls. It is densely crowded; a population of about 50,000 persons living on something like a square mile of area. The main streets are wide, and the houses of the richer people well built; but the narrow lanes are densely populated, and the soil of the backyards is saturated with privy filth and refuse of every kind, the accumulation of centuries. Open masonry drains are laid in the streets, but the levels are so bad there is no outfall. The water-supply from wells within the town was, I ascertained, in many places dangerously contaminated by the foulness of the surrounding soil.* I have urged upon the Municipal Commissioners the importance of a better system of scavenging, and the urgent need of completing a project for the water supply of the town, which was designed and partially executed many years ago, but which is still left unfinished. If insanitary conditions such as impure water, and a polluted surface soil favour the continuance of cholera in a locality, as I believe they do, the town of Madura must be constantly liable to the disease.

Water-supply impure.

* See Special Inquiry Report in Appendix.

The continuance of cholera, for so long a period in this district in 1870, bespeaks I fear the probability of a return of the epidemic during the present year, when the climatic conditions may be favourable to its increase.†

CHOLERA INVASION OF TINNEVELLY.

Particulars of first case in Palamcottah, 15th February.

70. The first case that attracted the notice of the authorities in this district was that of a European Official of the Great Southern of India Railway. This gentleman, who had only lately arrived in India, travelled down from Madras to Trichinopoly in company with two

† Cholera is again prevailing in the town of Madura as I write (February 16th, 1871).—W. R. C.

others, and halted for three days at Trichinopoly at a time when cholera was rife in the town. The party then proceeded by marches to Madura *en route* to Palamcottah. Cholera was present at Madura also when they passed through. At Satur, the chief town of one of the northern talooks of Tinnevelly, this gentleman was taken ill with diarrhœa, and remained behind, while the friends travelled on to Palamcottah. On the 14th February he felt himself well enough to proceed on his journey, and arrived at Palamcottah on the 15th. Here he partook of a hearty breakfast of indigestible food, which appears to have brought on a relapse, for at 2 P.M. the same day he was seized with violent vomiting and purging and died within twelve hours of the second seizure, in the Palamcottah Hospital, on the early morning of the 16th February.

According to the Civil Surgeon, the clothes used by the deceased in his last illness were destroyed by fire, but previous to his fatal seizure he had given out to a washerman the linen he had used at Satur, and on the journey from Satur to Palamcottah.

Extension of cholera to the dhobies' village where the linen of the first case was washed.

71. The next cases of cholera, coming specially to the notice of the authorities, occurred in the hamlet of Subramoniapoorum, close by the town of Palamcottah, a place inhabited by dhobies (washermen). It was to this village that the linen of the deceased Engineer had been taken to be washed. The Tahsildar, however, states that " a child about ten years of age, living in the vicinity of the hospital, died of cholera the day following the death of the Engineer," but no record of this death is to be found. The third person who died was a dhoby living at Subramoniapoorum in a hut opposite to the hut of the Engineer's dhoby. This death occurred on the 5th March, or sixteen days after the supposed infected linen had been taken away by the dhoby.

Early history of cholera in Tinnevelly obscure.

First case in Tinnevelly town on 18th March.

The early history of this cholera outbreak in the town of Palamcottah is obscure, and the evidence somewhat conflicting. Dr. Thompson, the Civil Surgeon, only heard of the existence of cholera in the dhobies' village on the 18th March, when it was too late to trace satisfactorily the connexion (if any) between the dirty linen used by a cholera patient and the individual cases of cholera subsequently occurring. The disease appeared for the first time in the town of Tinnevelly four miles distant from Palamcottah on the 18th March.

Communication traced between the dhobies.

The Tahsildar says that cholera spread itself "unnoticed about the dhobies huts" from the 5th to the 18th March, and he states, as the result of his inquiries, that the dhoby of the man who was the first to die in the *town*, was related to the dhobies at Subramoniapoorum, and that they lived in the same neighbourhood.

Up to the date of Dr. Thompson's inspection of the dhobies' village on the 18th March, it is certain that five persons had already died of cholera, and two were lying ill at the time of his visit. The Civil Surgeon declares he fully satisfied himself that the clothes of the deceased Engineer were taken to the dhobies' village, and washed by the dhobies. But there is no evidence, apparently, connecting the cholera with the particular dhoby who washed the clothes, and probably the time had gone by for the attainment of more precise evidence when Dr. Thompson commenced to make his inquiries.

Cholera deaths in dhobies' village.

March ...	5	June ...	3
April ...	6	July ...	2
May ...	2		

This washerman's village appears to have suffered considerably from cholera. The deaths are as noted in the margin.

72. But the district of Tinnevelly began to yield cases of cholera from the beginning of the year. In January, eight deaths were noted—two in the Tinnevelly talook, three in Nangunnerry, one in Satur, and two in Ottapidaram. In February the cholera mortality had advanced to forty-six, and in the Tinnevelly talook three villages had suffered, and it is very clear from the fact that fatal cases had occurred in twenty villages in the entire district, that cholera had begun to be active so early as February.

Cholera really present in the district in February.

The Collector of the district, in writing on the 20th May, thus describes the progress of cholera:—" The disease has been more or less prevalent in all parts of the district since the middle of March. It was at first confined to the towns and villages on the banks of the Tambrapawni river, the waters of which overflowed the banks to a great extent during the disastrous floods of November. The disease then travelled to the south-west and south of the Tambrapawni."

Collector's report.

" It has been confined almost entirely to the southern and western talooks, the northern talooks having been almost free."

In a later communication, dated 26th July, Mr. Longley, the Collector of the district, observes, " I regret to say that information has just reached me that cholera has also broken out in Streevulliputtur, the northernmost talook of the district, and which talook up to this date has been perfectly free from the disease." This latter observation is, however, scarcely correct, as the registration returns show three deaths in March, twenty-one in April, thirty-four in May, and thirty in June in the Streevulliputtur Talook, though it is very evident that the disease had not begun to spread rapidly in that talook. Nor did it, in fact, affect the Streevulliputtur Talook to any extent.

73. The marked characteristic of the cholera epidemic in Tinnevelly was the avidity with which it seized upon the low lying villages along the banks of the Tambrapawni, and other rivers, avoiding in the first instance the higher grounds, though spreading to them at a subsequent date. Mr. Longley has been good enough to furnish me with a list of the villages attacked up to the end of June, showing those situated on river banks, and those away from the influence of river moisture. The facts are embodied in the following table, and they are not a little remarkable as an illustration of the mode in which cholera prefers a moist soil to flourish in :—

Marked preference of cholera for villages on river banks which had been inundated by the late floods.

—	Ambasamoodram.		Tinnevelly.		Tenkarai.		Nangunnerry.		Tenkasi.		Satur.		Sankaranayanar Covil.		Streevulliputtur.		Ottapidaram.		Total.
	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	Deaths in places on river banks.	Deaths away from river banks.	
January	...	...	2	...	...	...	...	3	...	...	...	1	...	...	...	...	...	2	8
February	...	...	22	...	12	...	...	...	...	2	1	5	...	1	...	...	...	2	45
March	2	...	15	1	194	7	...	...	1	...	6	4	...	2	...	3	1	7	243
April	85	...	204	36	85	33	14	19	56	9	9	13	...	13	...	21	1	39	637
May	318	7	149	75	391	92	232	127	40	13	51	46	4	18	21	13	12	112	1721
June	237	1	210	61	301	102	229	388	15	24	20	59	...	27	...	30	14	190	1911
Total ..	642	8	602	173	986	234	475	537	112	48	87	128	4	61	21	67	28	352	4565

From this table we may summarise the following particulars :—

Months.	Cholera Deaths.	Deaths in Villages on	
		River Banks.	Higher Ground.
January	8	2	6
February	45	35	10
March	243	219	24
April	637	454	183
May	1,721	1,289	432
June	1,911	1,038	873
Total...	4,565	3,037	1,528

When we come to consider how few rivers there are in the district, and reflect on the enormous excess of mortality in the river valleys, as compared with that of villages on higher ground, we are enabled to understand in some degree what Pettenkofer means by asserting that there is a fixed relation between the development of cholera and the distance of sub-soil moisture from the surface.

Floods in Tinnevelly in November 1869.

74. Now, in regard to the unusual prevalence of cholera in the Tinnevelly District, and especially those portions of it that had been recently subjected to inundation, it must be noted that, in November 1869, a cyclone passed over the district, discharging an unusual rain-fall, which flooded the river valleys, and tended to raise the level of the sub-soil moisture greatly beyond its normal height. The average rain-fall for the whole district in the north-east monsoon of 1869 was 26·44 inches, and the greater part of this fell during the great storm of November that flooded the country. The average rain-fall of the three former years in October, November, and December was as in the margin. It will be seen that the mean rain-fall of the district, during the three months of the north-east monsoon, is between seventeen and eighteen inches, while in 1869 the quantity was nearly ten inches in excess. The difference, in fact, was quite sufficient to cause a very perceptible change in the level of the sub-soil water in the valleys and low lying grounds of the district, for the early part of the year 1870; but the exact nature of the changes, and their relation to cholera, cannot be shown as no observations were made in the district for testing Pettenkofer's theory.

Year.	Inches.
1866 ...	19·98
1867 ...	17·81
1868 ...	15·95

Note.—These averages are computed from eight district rain registers.

75. The progress of cholera in the district does not appear to have been influenced by the monsoon winds. It began, as we have seen in February, at the end of the north-east monsoon. It advanced southward in the months of March, April, and May, against the strong southerly winds that prevailed in those months, and the epidemic abated, or began to abate, in the middle of the south-west monsoon winds, and by the end of September the primary epidemic had lived out its life. The south-west monsoon continued to prevail in 1870 up to the middle of October. In December there was a reproduction of cholera in this district, the history of which will more properly fall to be noted in the cholera report for the current year.

76. The total cholera deaths in the district during 1870 was 7,611, and the proportion of mortality to a thousand of population in each registration circle is shown below:—

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Streevulliputtur ...	...	...	0·01	0·1	0·2	0·1	0·05	0·01	0·01	...	...	0·01	0·7
Satur	0·006	0·04	0·06	0·1	0·6	0·5	0·2	0·1	0·4	0·1	...	0·1	2·9
Municipal Town, Tuticorin	..	...	0·1	0·1	1·1	1·9	2·6	...	0·1	...	...	...	6·07
Ottapidaram ...	0·008	0·008	0·03	0·1	0·4	0·7	0·5	0·1	0 1	...	0·008	0·06	2·4
Tenk arai	...	0·05	0·9	0 5	2·2	1·8	1·6	1·1	0·3	0·07	0·009	0·1	8·8
Nangnnnerry ...	0·01	...	...	0·2	2·2	3·8	2·03	0·9	1·06	0·5	0·1	0·9	11·9
M. T., Tinnevelly ...	...	...	0·6	4 3	2·2	0·3	0·7	0·2	...	0·04	0·04	0·2	8·9
M. T., Palamcottah...	...	0 07	...	1.5	0 5	0·1	0·3	...	0·07	...	0·8	1·7	5·3
Tinnevelly Talook...	0·01	0·1	0·1	0·8	1·1	1·7	0·8	0·09	0·04	0·01	0·02	0·6	5·7
Ambasamoodrum ...	...	...	0·01	0·5	2·1	1·5	0·5	0·1	0·02	0·03	0·01	0·7	5·7
Tenkasi	...	0·01	0·09	0·5	0·4	0·3	1·1	1.03	0·1	0·05	...	0·9	4·8
Sankaranayanarcovil	...	0·006	0·01	0·08	0·1	0·1	0·1	0·1	0·1	0·01	0·02	0·09	0·9

The next table, compiled on the general plan of those preceding, exhibits the number of villages, and the populations affected. It will be noticed that there was a great difference in the intensity of the disease in various parts of the country. Speaking generally, the northern talooks of the district suffered the least, while the districts on the sea-board and the southern talooks, especially such of them as were flooded after the cyclone in 1869, suffered in an unusual degree.

Table showing particulars of Cholera Deaths in each Municipal Town and Talook of the Tinnevelly District, during each month of the year 1870.

Tinnevelly.	Streevulliputtur Talook, N. of District.			SaturTalook, N. of District.			Tuticorin Municipal Town, S. E. of Talook.		Ottapidaram Talook, E. of District.		
Population.	154,719			145,016			9,544		237,093		
Total No. of Villages in each Circle.	499			310			—		225		
Months.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.
January ...	...	...	...	1	373	1	954	...	2	3,934	2
February ...	...	...	...	5	9,931	6		...	2	2,896	2
March ...	2	5,183	3	6	16,764	10		1	6	4,139	7
April ...	5	6,632	21	11	28 869	22		1	15	16,256	39
May ...	8	23,760	34	24	40,596	97		11	37	30,173	113
June ...	9	39,955	30	28	38,070	79		19	57	59,266	185
July ...	2	16 636	8	18	30,899	30		25	43	48,364	136
August ...	3	14,764	3	11	26,533	26		...	17	15,608	36
September ...	1	...	3	23	41,789	67		1	17	26,406	32
October ...	...	...	...	7	10,220	15		...	..	...	...
November ...	...	...	...	...	...	...		...	2	1,703	2
December ...	3	6,859	3	10	25,801	24		...	10	10,466	16
Total...	-	—	105	-	—	377	—	58	-	—	570

Tinnevelly.	Tenkarai Talook, S. E. of District.			Nangunnerry Talook, S. of District.			Tinnevelly Municipal West of Talook.		Palamcottah Municipal Town, Centre of Talook.	
Population.	218,245			159,051			21,553		13,315	
Total No. of Villages in each Circle.	1,040			763			—		—	
Months.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	Population.	Cholera Deaths.	Population.	Cholera Deaths.
January ...	...	...	...	3	19,286	3	21,553	...	13,315	...
February ...	6	13,549	12	..	...	...		...		1
March ...	32	105,208	201	...	...	...		14		...
April ...	27	63,249	118	14	16,604	33		94		20
May ...	49	132,666	483	52	72,664	359		48		7
June ...	52	135,496	406	79	106,032	617		8		2
July ...	54	134,206	356	60	49,465	323		17		5
August ...	35	65,399	243	35	66,373	149		5		...
September ...	14	38,609	72	35	61,241	170		...		1
October ...	10	20,031	16	26	32,153	92		1		...
November ...	2	6,551	2	12	22,631	21		1		11
December ...	10	22,161	28	33	37,722	140		5		24
Total...	-	—	1937	-	—	1907	—	193	—	71

Tinnevelly.	Tinnevelly Talook, S. of District.			Ambasamoodram Talook, S. W. of District.			Tenkasi Talook, W. of District.			Sankaranayanar Covil Talook, N. W. of District.		
Population.	148,253			149,323			109,685			158,222		
Total No. of Villages in each Circle.	476			402			230			270		
Months.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.	No. of Villages affected.	Population of affected villages.	Cholera Deaths.
January ...	2	1 545	2	...	...	...	...	...	...	...	...	...
February ...	3	6,838	22	...	...	...	2	3,427	2	1	7,067	1
March ...	9	18,494	17	2	3,752	2	1	1,368	1	2	4,073	2
April ...	38	54,352	126	24	65,784	85	12	26,359	65	3	15,101	13
May ...	40	75,188	169	50	118,180	325	16	15,357	53	8	23,598	22
June ...	66	72,579	261	41	97,086	238	15	31,340	39	7	26,964	27
July ...	37	57,358	119	18	53,047	76	19	46,539	124	8	33,015	27
August ...	11	13,419	14	12	36,347	15	17	46,795	113	5	9,543	22
September ...	3	3,902	7	4	14,689	4	9	14,622	21	8	21,226	20
October ...	5	3,957	5	4	17,213	5	4	3,468	6	1	10,938	2
November ...	2	1,870	2	1	1,104	2	...	...	...	3	7,342	4
December ...	26	79 536	100	22	76,050	112	19	41,233	107	7	23,947	14
Total...	-	—	844	-	—	864	-	—	531	-	—	154

77. In connexion with the epidemic invasion of the Tinnevelly District, I think it right to record here some facts elicited by Rev. J. F. Kearns, a Missionary residing at Puthiamputtur. This gentleman, in January 1869, addressed a letter to Government, giving his views on the causes which appeared to him to have diminished the liability of the inhabitants of the village in which he resided to suffer from epidemic cholera. The letter is appended.

Facts in regard to an exempted village in Tinnevelly.

From the Reverend J. F. KEARNS, Missionary of the Society for the Propagation of the Gospel in Foreign Parts, to the Chief Secretary to Government, Fort Saint George; dated Puthiamputtur, 7th January 1869.

I happened to see lately a copy of the Proceedings of the Madras Government, Public Department, 3rd November 1868, in which the village in which I reside (Puthiamputtur) is returned as "exempt" from cholera, "cause unknown." I venture to make a few observations with reference to the foregoing, which may, perhaps, be not unacceptable to Government.

2. When I took up my residence here in 1856 as a Missionary, there were few villages in this talook which suffered more from cholera and fever than Puthiamputtur. The village presented an appearance of desolation and wretchedness, such as I had never seen in the south of Tinnevelly, where I had previously been. There was scarce a tree to be seen, and in the large Mission compound, on the western side of the village, there was but a solitary tree standing. The village contains several wells, all with excellent water; but at the time of my arrival, the two principal wells were surrounded each by an extensive pool of stagnant water formed by the waste from drawing, and continually percolating through the earth into the well. From these pools, there extended right through the principal street a long filthy channel containing any excess that escaped from the pools, and the effluvia arising from them was so great, that, riding by them at early morn, I have been obliged to put my handkerchief to my mouth. The yards of the Natives' houses were all in a most disgusting state, and I was not astonished that the number of people who that year succumbed to the attacks of cholera was fearfully large. I placed myself in communication with the Collector, and explained my views and wishes to him, and he most cordially agreed with me, and sent orders to the Tahsildar to assist me, as far as possible, in my endeavours to improve the place. Accordingly with this aid I had every well walled up, the two filthy channels cleaned, one deepened and extended, so as to carry the water beyond the village, and the other diverted into a field, the owner of which at first stoutly resisted us, but he has since discovered, as I told him at the time he would, that the channel has been a source of wealth to him. The pools were filled up altogether, raising the earth round the wells sufficiently high to throw the water off; and we had removed from the yards every particle of manure which they contained, and the practice since has been to remove all manure from the yards a clear month before the monsoon sets in. I next commenced to plant trees; and a village, which was once remarkable for the absence of trees, is now as remarkable for the rich luxuriant trees which surround it, and the benefits of which the people acknowledge and appreciate. There are at present standing in the streets, on the road surrounding the village, and in the Mission compound, altogether 700 trees, all of them valuable, the greater number being margosa, and all planted by myself. I make it a practice to have the streets thoroughly cleaned at stated periods, but I never permit filth to remain for an instant in the public streets. In addition to all this, I have endeavoured to impress upon the minds of the people the great value of sanitary precautions, and I am happy to say that I have been successful to some extent. Perhaps to these improvements, under a merciful Providence, the immunity referred to in the Proceedings of Government is due; and here I would record the ready help which I have always received from the Collector for the time being, to keep the village in a clean and healthy state; I would also mention the hearty co-operation of our intelligent Village Moonsiff.

3. The value of trees in a village, and how their presence ministers to the health of the inhabitants, are well known; but in north Tinnevelly, where they are far more needed than in the south, owing to the extensive tracts of black cotton soil from which the heat radiates with great intensity, very few streets enjoy the grateful shade which may be experienced in almost every village in the south; and this is entirely due to the fact, that the Zemindars claim *every tree* upon their estates, no matter by whom planted, and no matter where; and this deters the people from planting their

streets, as otherwise in the great majority of cases they would do, and so add to their comfort, if not to their health. If not incompatible with the practice of Government, I would feel thankful for a copy of the Proceedings referred to.

It will be seen that Mr. Kearns lays much stress on the planting of trees, on the preservation of the purity of drinking water, and generally on systematic village conservancy, all of which had been practically supervised by himself in past years.

78. After the very general prevalence of cholera in the district in 1870, it occurred to me to inquire what the condition of Puthiamputtur and the neighbouring villages had been in regard to cholera. Mr. Kearns, in reply, was good enough to inform me that the village had preserved its immunity, though one inhabitant took cholera in returning from the Trichendoor feast and died in the village. On my further request, Mr. Kearns obligingly undertook the investigation of the condition of other groups of villages which had been subjected to inundation; and, as the results have an important bearing on the influence of village conservancy and sanitation, I give his reports, *in extenso*, below. I wished particularly to ascertain the condition of the water-supply of the exempted villages, and of those which suffered from cholera. Mr. Kearns' description of the water-supply of Puthiamputtur, and the villages near it, is sufficient to show that the people drink a pure water, and my own observations of surface water in black cotton soil districts, enables me to corroborate him in describing such water as abounding in organic impurity, and probably also in the germs of guinea-worm. Such water is indeed very unsuited for the maintenance of health.

Letters from the Rev. J. S. Kearns, on Cholera in the Tinnevelly District (Puthiamputtur.)

No. 1.

"In reply to your letter of the 22nd December 1870, I have the pleasure to inform you that, as you requested, I have made an exact inquiry respecting the population of this and adjacent villages, and the deaths from cholera which occurred in them from 1st January to 1st December 1870, inclusive; and the results of my inquiry, I now give you in detail, viz. :—

Puthiamputtur.

Puthiamputtur contains 2,104 inhabitants, and, during the period noted above, and, of course, during the recent epidemic of cholera in Tinnevelly, it was free from cholera. One man died *in* the village of it, but he contracted it at *Trichendoor*, whither he had gone to attend the festival, and was brought in here in a dying state, and survived but a couple of hours.

Geology of Puthiamputtur.

Puthiamputtur stands upon a limestone conglomerate, and the red quartz soil runs down upon its western side, and on the north and east the well known black cotton soil touches it.

Pure water-supply.

It has drinking water of the purest quality, a luxury which few places around us possess.

Rasamin covil.

Rasamin covil is a village about half a mile to the eastward of us; it contains 300 inhabitants; there were no deaths from cholera during the above-mentioned periods.

Swaminathum.

Swaminathum is a village one mile to the eastward of us; it contains 1,311 inhabitants, and there were no deaths from cholera during the above-mentioned period. In former years both these last named villages suffered much from cholera.

Sanitary improvements.

About three years ago, I induced the head man of Swaminathum to plant the streets of the village with Margosa and other trees. The main street has now a number of handsome trees in it; there is a small grove to the east of the village, and about two furlongs of road leading to the north have also been planted. This village has entirely altered for the better in every respect, and, although there is not a Christian in it, the principal men of the place are always ready to carry out any of my plans for improvement into effect.

Water obtained from Puthiamputtur.

I should remark that there is no *drinkable water* in those villages; all water for drinking purposes they obtain from *our wells.*

Tuticorin, a Municipal town, is nine miles to the eastward of us. There were fifty-eight *deaths* there from cholera during the period above-mentioned.* Muperapetty is a village one mile to the north of us; it contains 663 inhabitants, but there was no death there from cholera during the period mentioned above. This village is on the high road to Madura; it is built upon quartz rock; is dry and well drained. On the western side the country is open; a quarter of a mile from the village is a ridge of quartz rock, about forty feet above the level of the high road. This ridge runs for some miles, like a backbone through the country; and on either side of it, the land falls off with a gentle slope east and west. On the eastern side of the village, there is an extensive rice cultivation and large tanks.

Tuticorin.

Village on quartz rock.

Ottapidaram is the talook town, and contains 1,115 inhabitants. There was no death there from cholera during the period. This town is also built upon quartz; it is *somewhat* higher than the adjacent fields. the country round it is open, extensive, and healthy. The town is tolerably well planted, and every year something is being done to improve it. Being the residence of the Tahsildar, and being frequently visited by the Collector or his Assistants—besides being a Police Station—its sanitary arrangements are carefully attended to; indeed all the villages which I have named being in the vicinity of the talook, or to some extend under my influence, are more or less attended to, and moreover the people are beginning to see that cleanliness *is* profitable in more ways than one. The following statistics may have some interest for you. By the Aneroid, Puthiamputtur is eighty feet above the level of the sea; the barometer and thermometer are registered twice daily; the highest reading of the barometer of the period mentioned was 30·12, the lowest 29·64; the highest reading of the thermometer being 98°, and the lowest 78° (indoors); during the period we had forty-two *rainy days*, the total fall of rain being $20\frac{11}{20}$ inches. The rain register at Ottapidaram shows but thirty-three rainy days for the same period, and the total fall registered is $20\frac{15}{20}$ inches. The readings from the rain register at Tuticorin I have not been able to get, but I have reason to know that the fall there has been very scant.

Ottapidaram.

Conservancy attended to.

Meteorology.

Against fourteen successive rainy days which we had last month, there are but *three* reported from Tuticorin. Between us and Tuticorin there are nine miles of a flat, almost treeless, country. The vicinity of the town consists of low sandy flats, so that there is nothing to attract the passing clouds as they roll down from the north or north-east."

No. 2.

"Your letter of the 6th instant should have had an earlier reply; but, as my investigations extended over a wide field, delay was unavoidable. I have now the pleasure of sending you the results of my inquiries. I should observe that these inquiries have been confined entirely to my own district or parish, sufficiently large, however, to give a fair idea of the state of North Tinnevelly, as the district is from 50 to 60 miles in length.

Extended inquiry regarding the sanitary condition of the Mission District.

Sawyerpuram Division of the district lies but a few miles from the north bank of the river. The soil is for the most part that which is generally known as the "red sand," consisting of the detritus of quartz rock, and containing a large share of black grains of iron ore. On this soil the water is good. The eastern portion of the division is bounded by the sea; it consists of, in places, a fine strong clayey soil, well cultivated with rice; in other places, along the coast line, of lagoons of brackish water, stagnant for a considerable portion of the year. The palmyra juice and sugar form a very considerable portion of the food of the inhaibtants. During the floods of last year the eastern part of this division, lying as it does on the very mouth of the river, suffered very severely. The village of Sawyerpuram in which the Theological Seminary stands gives its name to the division, and is about thirteen miles south of Puthiamputtur. My inquiries extended over twenty villages in that division, *i.e.*, over seven in Sawyerpuram west, and thirteen in Sawycrpuram east, or that part which lies on the sea, and the following results were obtained :—

Sawyerpuram West.

Sawyerpuram.—A village containing 126 inhabitants. There were four cases of cholera during the epidemic but no deaths.

Subbramanyapuram.—A village quarter mile south of Sawyerpuram, containing 800 inhabitants. There were nineteen cases of cholera, and of these five died.

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* The water-supply of Tuticorin is said to be generally brackish, and of doubtful quality.—(W. R. C.)

Mullavalli.—A village a quarter of a mile to the west of Sawyerpuram, containing 300 inhabitants, There were seventeen cases of cholera, six of whom died.

Kunarapuram.—A small hamlet adjoining ; it contains but sixty inhabitants. There were four cases of cholera, but no deaths.

Sauthiambalam.—A village about a furlong to the north of Sawyerpuram ; it contains 215 inhabitants. There were seven cases of cholera, but only one death.

Kaddarangkullam.—A village two miles to the north-west of Sawyerpuram ; it contains 199 inhabitants. There were five cases of cholera, one only of which was fatal. So that in this group of villages there are 2,600 inhabitants; during the epidemic there were among them fifty-nine cases of cholera, thirteen of which were fatal.

Sawyerpuram East.

Idiarkadu.—A village containing 250 inhabitants ; it is in a direct line four miles from the sea. There were five cases of cholera during the epidemic, but no death. This village suffered terribly from the flood ; the water rose four feet high, but for a pucka built house, upon the roof of which many of the inhabitants took refuge, and there spent the night exposed to the rain and wind, and for the Mission bungalow which has a plinth about five feet above the surface, where the others obtained shelter, many lives would have been lost.

Agaram.—A village east of Idiarkadu ; it contains 300 inhabitants. There were three cases of cholera, but no deaths.

Maramangalum.—Contains 300 inhabitants. There were four cases of cholera, two of which terminated fatally.

Acasaly.—Contains 250 inhabitants. There were seven cases of cholera, five of which ended fatally. The latter three villages are surrounded by rice fields; the water is not very pure.

Kolkhi.—Contains about 400 inhabitants. There was but one case of cholera and no deaths. This village is on the east side of a lagoon ; it is considerably higher than the lagoon ; its site is entirely sea sand, and it is well exposed to the influence of the sea ; from which it is distant only four miles.

Umerikadu.—Distant from the sea four miles ; it contains 300 inhabitants. There was but one case of cholera, and the patient recovered.

Sebathiapuram.—A village containing 500 inhabitants; it is on the red soil; is surrounded by palmyra trees ; distant from the sea six miles. There were six cases of cholera, but none of them fatal.

Nadvookurchi.—About half a mile south-west of the preceding village, situated on heavy red sand surrounded by palmyras ; contains a population of 300 inhabitants. There were two cases of cholera, but both recovered.

Puliankadu.—Adjoins the latter village ; it contains 200 inhabitants. There was no case of cholera.

Iravapuram.—Is a very small hamlet, with but twenty inhabitants. No case of cholera.

Settikullam.—Contains 450 inhabitants. It is in a dry situation ; soil sandy ; palmyras and thorn jungle around it. There was but one case of cholera, the patient recovered.

Thalavaipuram.—300 inhabitants ; two cases of cholera, both recovered.

Gutharavellei.—200 inhabitants ; one case of cholera, but the patient recovered.

Of 3,970 inhabitants in this part of the division, thirty-three persons were attacked by cholera during the epidemic; of which number seven only proved fatal.

Puthukotie Division.

The above division lies between Sawyerpuram and Puthiamputtur, and is about ten miles in length. The soil is partly of " red sand," partly of strong yellow clay, and partly of the real black cotton soil. The eastern side of it, lying along the sea, is rather swampy, but all this swampy soil shall, as soon as the new channels have been completed, become excellent land for wet cultivation. Except on the black cotton soil the water is very fair.

Koodangkadu.—A village on sandy soil; it possesses good water; there are 225 inhabitants. There was one case of cholera, and it was fatal.

Servarkaran-madam.—A village on red soil, surrounded with palmyras ; water good ; 300 inhabitants. There was one case of cholera, and it was fatal.

Sebananapuram.—A village similarly circumstanced. It contains 180 inhabitants. There were three cases of cholera, and the three were fatal.

Keliankarasal.—A village on the verge of a large plain, well exposed to the influences of the sea ; water good ; soil sandy. It contains 550 inhabitants. There was one case of cholera, and it was fatal.

Maravan-madam.—A village on the junction of the cotton and red sand soil; water rather poor; site healthy and well drained. There was one case of cholera, and it proved fatal.

Melseithalei.—Is a market town about ten miles north of Puthiamputtur; it stands upon a gravel soil, the rock below being gneiss. It has excellent water, but not an abundance of it. The black cotton soil entirely surrounds it. It contains 600 inhabitants. There was one case of cholera, and it proved fatal.

Kalanperambu.—Is a village on the black cotton soil; it is about two miles east of Melseithalei; it contains 300 inhabitants. There were four cases of cholera, and all terminated fatally. The water in this village is very bad, and the village itself is a conglomeration of filth of every description.

Sackamalpuram.—Is a village three miles from Kallanperambu to the north; it is on the black cotton soil, and contains 300 inhabitants. There were two cases of cholera, but not fatal. The water is bad, and the village is extremely filthy. As a rule, villages on the black cotton soil are kept in a very filthy state.

Veppalodei.—Is a village four miles due east from Kallauperambu; it is on the "red sand soil;" is buried almost in palmyra forests, and contains a population of 600. There were three cases of cholera, all of which proved fatal. The water here is pretty fair; but the diet of the people is poor, besides which they are for the most part badly housed.

Nagalapuram.—Is a market town on the north bank of the Veypar river, and is about thirty-five miles north from Puthiamputhur. With its hamlets it contain 4,500 inhabitants. There were ten cases of cholera, all fatal. This town is built on rock; it is dry and has excellent water, but the streets are kept in a filthy state, especially at the back of the town. There is one street or road adjoining the houses used by the people for a common privy, and to pass near it is simply horrible.

Thuresamipuram.—Four miles to the east of Nagalapuram; is on black cotton soil; it contains about 400 inhabitants. There were ten cases of cholera, and all proved fatal. It is worthy of remark that these ten cases were confined to one house, all of them relatives, and all took the disease after a heavy meal. This and the fact that it ceased immediately led me to suppose that there was something in their food, which accelerated other predisposing causes.

Water-supply, Puthiamputtur.

Such is the information which I have been able to glean for you. I have only a few more observations to make. The water in Puthiamputtur is obtained from springs in the natural rock, to reach which we have to dig *wells*. These wells are walled up, and the water is raised by the ordinary pecotah. To explain why the water in Puthiamputtur is so pure is, perhaps, beyond me, but very pure indeed it is. It appears to me that its purity is due in part to two causes, first, the springs are in rock; and secondly, the rock is overlaid by a thick close concrete, fifteen feet in depth, through which the surface water, *i.e.*, rain water, &c., &c., must percolate or filter, before it can reach the water in the wells. This filtering must necessarily act as a purifier.

Water of the black cotton soil districts.

The water in villages on the black cotton soil is simply execrable, both as regards taste and smell. It abounds with the ova of the guinea-worm, and during the hot season it is no uncommon thing to find one-fourth of the inhabitants suffering from guinea-worm. Ordinarily the people use some alkali to precipitate the vegetable matter, &c., &c., with which the water is impregnated (the commonest in use being the ashes of burnt cholum straw), and, although this does clear it to a considerable extent, it is nevertheless far from being pure drinking water. With such water, the wonder is, that there is not more illness, but possibly this can be explained.

The food of the people, even of the wealthy in North Tinnevelly, consists of a grain-called *cumbu* (Penicillaria Spicata.) It is highly nutritious far more so than rice, and has an acidity that is considered very agreeable. This grain is cooked but once daily, *i.e.*, for the evening meal, but sufficient is then cooked to last for twenty-four hours. What remains after the evening meal is rolled up into huge balls and immersed in pots of butter-milk, or of water only, according to the circumstances of individuals. During the night it undergoes a process of fermentation; at morning the cooked grain and the milk are as acid as possible. The balls of grain serve for breakfast, and the milk or water is carried to the fields for their mid-day repast. Whether this description of food acts as a preservative against cholera, or fever I know not. I submit it to your judgment, but I remember a Clergyman pointing out to me a tract of country which had never been visited by cholera, and the general belief was, he said, that this immunity was due to the cider-drinking habits of the people. I cannot just now remember anything more likely to interest you, but I shall feel happy to give you, at any time, any information in my power."

EXTENSION OF CHOLERA TO CEYLON.

79. Although the sanitary supervision of the Island of Ceylon does not fall under my jurisdiction, this would seem to be the proper place for noting that the epidemic, after invading the Tinnevelly District, passed over to the north shores of the island, which were reached early in June. A local outbreak had occurred, however, in a village near *Point de Galle* so early as the 16th May. It would seem probable that the Galle cholera, and that on the northern road, must have reached the island by different routes. The particulars in regard to the development of cholera in Ceylon point, I think, most clearly to the influence of human intercourse between the Southern districts of India and Ceylon, the localities affected being chiefly those on which coolies travel to and fro.

Invasion of Ceylon in June.

Influence of immigration from Southern India.

The report of the Principal Medical Officer, Civil Department, Ceylon, is given below.

From the Principal Civil Medical Officer and Inspector-General of Hospitals in Ceylon, to the Honourable the Colonial Secretary, Colombo, dated Colombo, 28th September 1870, *No.* 339.

I have had the honour to receive your letter, No. 253, of the 28th July, transmitting to me copy of Proceedings of the Madras Government, dated the 9th July, No. 850, on the subject of cholera in Southern India, and requesting me to report on the origin and progress of the present outbreak in Ceylon.

2. In explanation of the delay in forwarding this report, I have the honour to state that I awaited the receipt of the report, called for from the Colonial Surgeon of Jaffna, on the result of his visit of inspection down the central road from Jaffna to within a few miles of Dambul and on his return, striking off at Mattakachchee along the road to Mannar, which is frequented by the cooly immigrants proceeding from the coast to the interior of the island.

3. This report, with its explanatory maps, is now attached, and it affords a full detail of the origin and progress of cholera along the central road traversed by coolies on their way to the interior of the island, and on their return to the coast.

4. It also finally settles the question as to the origin of the disease, which has been recently raised by the Government Agent for the Northern Province.

5. The letter of the Sanitary Commissioner to the Indian Government, dated 1st July, No. 695, clearly states "that cholera had been prevailing in the Southern Districts of India for some months past.

"The disease became general in Tanjore so long back as October and November 1869. It then extended to Trichinopoly and Madura Districts, and, lastly, to Tinnevelly."

6. It had, moreover, prevailed in Tuticorin, in a minor degree, from 25th April.

7. With these statements, and the facts brought forward by Dr. Ondaatfe, no reasonable doubt can remain that the cholera which appeared in the north of the island and extended itself along the central road even as far as Matale and Kandy—spreading, in a few instances, laterally to Anuradhapura and some neighbouring native villages, as reported by the headmen, locating itself in some of the bazaars, where the in-coming coolies were in the habit of resting, and thence regurgitating backwards to Davipatam by means of gangs returning to the coast contracting the disease at the halting places resorted to by the infecting gangs recently arriving—had its origin in the Southern Districts of India, and not in Ceylon.

8. The first cases reported at Matale were coolies picked up on the road while proceeding towards the interior of the island on the 19th and 20th June, and the two first cases which occurred in Kandy were two Canarese, also on their way to the coffee districts, who were found in a state of collapse in the cooly shed at Mahayawa, at a distance of a mile from the town on the 12th June, both dates being from nine to sixteen days subsequent to the first cases reported along the central road.

9. The disease extended in Matale and in Kandy to the inhabitants; but, although very fatal in its results, it limited itself to a comparatively few cases in both towns, and can no where be said to have assumed the form of an epidemic.

10. I have attached a table showing the dates of the first and last attacks, and the number of cases and of deaths at all the stations where it has made its appearance.

11. Independently, however, of such cholera as appeared in the Northern and Central Provinces in connexion with the immigrant coolies, and which has been traced to India, the disease arose spontaneously in a small cluster of villages in the neighbourhood of Galle, as noticed by the Sanitary Commissioner in the 3rd paragraph of his letter.

12. The first case brought to the knowledge of the authorities—for I suspect other cases had occurred previously but were not reported—was a Singhalese woman on the 16th May, at a small village named Callawelle, one mile to the north-east of Galle. The disease rapidly extended itself to the small villages in its neighbourhood, within a radius of three to five miles, but did not enter Galle.

13. Thirty-three cases in all were reported, of which twenty-two died, and the last case occurred on 2nd July.

14. I am unable to offer any explanation of the origin of this small outbreak The people were mostly Singhalese of the Washer caste. There is no evidence of its having been brought to the locality, and it confined itself within a small limit.

15. There were local causes in abundance, in the shape of filthy compounds and stagnant pools, emitting volumes of sulphuretted hydrogen from decaying cocoanut husks; but these evils are to be met with all along the sea-board of the Southern Province, without apparently prejudicing the public health.

16. The next appearance of cholera in the Southern Province was among the pilgrims on their return from the festival at Kattregam.

17. I have received no report of the health of the pilgrims during the festival itself, and they were free from disease during their progress from Colombo through the south of the island to Kattregam.

18. It was on their return that cholera appeared among them.

19. There is no evidence to show whether the disease broke out spontaneously among them, or whether it was brought to the spot by pilgrims proceeding there from the coast of India and the north of the island; but it prevailed among them, though not in a very severe form, the whole way from Kattregam to within a few miles of Colombo. It was conveyed, in a few instances, to the residents of localities through which the procession passed; but I believe that the preservation of the public health on this occasion was mainly due to the extraordinary efforts made by the authorities, and the precautionary sanitary measures adopted, to prevent the spreading of the disease in the neighbourhood of populous towns.

20. The first case reported to the authorities occurred in the district of Hambantota, where, between the 14th and 30th July, nine cases occurred, all of which proved fatal.

21. As the procession advanced to Tangalle, five cases were reported from that station between the 17th and 20th July, of which four were pilgrims and one a resident of the place. Of these five, two died.

22. At Matara, the next important station on their road, eleven cases were reported between the 22nd and 25th July, of which nine died. These were all pilgrims, and seven were females.

23. The next report came from Galle, where sixteen cases were reported from the pilgrim camp, which was not allowed to approach nearer than 4½ miles from the town.

24. Of these, the Medical Officer states, that five were treated in a hospital shed erected on the site of the camp, three died and two recovered. Two were treated in the verandah of a non-occupied house, near which they were found lying.

25. Five surreptitiously entered the town and died there, and the remainder died in the camp.

26. One resident of the town, a Singhalese, contracted the disease and died.

27. It is highly probable that many other cases occurred along the road which escaped the knowledge of the authorities.

28. As the procession left Galle, they halted at a Moor village named Gintota, 4½ miles on the Colombo road, and here the disease was conveyed to the residents.

29. Two cases of choleraic diarrhœa occurred on the 27th July, and on the 29th nine cases of true cholera were developed, and a little epidemic of cholera and choleraic diarrhœa was established among the residents of that village, which lasted to the 19th August, when the last case was reported.

30. One hundred and nineteen cases occurred between the 27th July and 19th August, of which twenty-seven proved fatal.

31. This small outbreak was entirely due to contagion conveyed by the pilgrims, the low sanitary condition of the place encouraging the rapid development of disease. Like Callawelle, the village is surrounded by stagnant pools of water, in which the husk of the cocoanut is left to decompose, emitting a most offensive odour.

32. As the procession advanced towards Colombo, the disease began to exhaust itself. Twenty-one cases were officially reported by the Medical Officers appointed to accompany them, of which only five died, showing that amelioration in the intensity of the attacks, which generally occurs as, the disease dies out.

33. They were detained for forty-eight hours at a distance of eleven miles from Colombo ; and, as no fresh cases occurred among them during that time, they were permitted to enter the town, and no evil consequences followed.

34. It remains for me now to advert to the other localities appearing in my statement in which cholera made its appearance.

35. *Colombo.*—On 15th June a prisoner, who had been confined for some time previously in the Hultsdorf Jail, was attacked and died.

36. On 17th June, another long-sentenced prisoner in the Welikade Jail, which is at a distance of more than two miles from the Hultsdorf Jail, and has no communication with it, was attacked and died.

37. On the 18th, a resident of Grand Pass, a Singhalese, was attacked and died.

38. Solitary cases continued now to occur in different quarters of the town at periods of a few days from each other, and having no possible communication with each other.

39. Six more cases occurred in the Welikade Jail on the 12th, 14th, 17th, 26th, 28th, and 30th July, respectively, when it ceased.

40. All the cases in the town were spread about promiscuously, the disease never locating itself in any one quarter, with the exception of one large compound in Sea Street, in which a number of cattle were kept tethered day and night, and the grounds were filthy to a degree.

41. This compound was surrounded by small miserable huts inhabited by Moors and Malabars. Between the 13th and 26th August eight cases occurred, six of which proved fatal.

42. The 29th August is the date of the last case reported in Colombo, and between that and 15th June, the date of the first case, twenty-nine cases were reported, of which twenty-three died.

43. It cannot be said to have been epidemic at any one period. Cases occurred in every quarter of the town, and in not one instance could any direct contagion be traced. They were all of a very severe type, and the deaths were generally rapid. The appearance of the disease in the two jails is altogether mysterious. In both instances it was controlled by the greatest attention to sanitation, a lavish expenditure of disinfectants, the immediate segregation of the patients (in the Welikade Jail each case was removed at once without the walls), and the destruction by fire of every article of bedding and clothing which had been used by those infected.

44. In Badulla, twelve cases with nine deaths occurred between the 6th and 28th July.

45. It is more than probable that the disease was conveyed to this station from Kandy.

46. At Batticaloa, nine cases with five deaths were reported. The disease, in this instance, was clearly traced to two travelling men who had just returned from Badulla, where it was then prevailing.

47. At Kurunegala, a fatal case occurred on the 30th June. The individual had arrived from Kandy only two days previous to the attack.

48. A few cases were reported in the Peninsula of Jaffna. Between July 6th and August 25th, twenty-three cases were reported, of which eleven died.

49. The disease became established in a village called Vertettivo, situated thirteen miles to the east of Mannar, where thirty-seven cases occurred among the residents between the 12th July and 26th August; of these, twenty-three died.

50. At Pesalle, the port at which the immigrant coolies arrive from the coast, the residents were attacked. The first two cases, however, as reported by Mr. Ondaatfe, were coolies returning to the coast on the 23rd June (and they had evidently contracted the disease along the central road), and a resident of the place was seized on the same day.

51. I regret to state that cholera continues to prevail at Pesalle, forty-six cases having been reported from the 23rd June to 21st September, the date of my latest report. Of these, twenty-five have died.

52. Although the disease visited every province in the island, including its chief towns, it has shown no disposition to spread; the total number of cases have been few, and it has now entirely disappeared, with the exception of Pesalle, where it still continues.

53. Since commencing this report, I have received a communication from the Colonial Secretary to the effect that it has again made its appearance near Batticaloa.

54. A reference has been made to the Medical Officer of that station for information on the subject; but these reports are so frequently made by headmen, during cholera seasons, without any foundation, that I must beg to discredit it.

55. I have said little on the progress of the disease along the central road, as its history has been very fully recorded in Mr. Ondaatfe's report, to which I have the honour to invite special attention.

Statement showing the Stations where Cholera has appeared, the Number of Cases and Deaths which had occurred since the beginning of the outbreak, 16th May last.

Provinces.	Stations.	Date of first attack.	Date of last attack.	No. of Cases.	No. of Deaths.	Remarks.
Southern...	Galle...	May 16	July 2	33	22	
	Do. second outbreak on the pilgrims ...	July 21	„ 27	17	14	
	Do. Gentota ...	„ 29	Aug. 19	119	28	
	Hambantota... ...	„ 14	July 30	9	9	Pilgrims.
	Tangalle	„ 17	„ 20	5	2	Do.
	Matara	„ 22	„ 25	11	9	Do.
	Pilgrims on Colombo road from Galle ...	„ 25	„ 27	6	2	
Northern...	Mannar	June 1	Sept. 12	86	64	
	Central road... ...	„ 3	July 11	48	29	
	Mannar road to Matakachchee	„ 3	„ 27	12	10	
	Pesalle	„ 23	Sept. 21	46	25	
	Vertettivo	July 12	Aug. 26	37	23	
	Jaffna	„ 6	„ 25	23	11	
	Anuradhapura ...	June 11	July 13	5	5	
Western	Colombo	„ 15	Aug. 29	29	24	
Central ...	Kandy	„ 12	„ 1	36	28	
	Matalé	„ 19	July 23	34	25	
	Badulla	July 6	„ 28	12	9	
North-Western ...	Kurunegala	June 30	June 30	1	1	
Eastern	Batticaloa	July 17	Aug. 4	9	5	

From W. C. ONDAATFE, Esq., Acting Colonial Surgeon, to the Principal Civil Medical Officer and Inspector-General of Hospitals, Ceylon, dated Colonial Surgeon's Office, Jaffna, 30th August 1870.

Having completed my inspection of the cooly stations on the line of road traversed by the Indian immigrants from Pesalle, in Mannar, the port of arrival and departure to Allagamowa, on the boundary of the Northern Province, an extent of 102 miles, I have the honour to submit, as required by the concluding paragraph of your letter of the 15th ultimo, the following report which embodies the results of my inquiry as to whether cholera first appeared among the coolies arriving from, or returning to, the coast of India.

2. Agreeably to your instructions, I proceeded along the central road, arriving on the 22nd July at Matakachchee, the point from which I commenced to prosecute my inquiry, which I conducted, as far as circumstances permitted, in the mode here indicated.

3. The canganies and patrols, who have the earliest opportunity of seeing the cholera patients, were required to be present at the inquiry, the former being directed to produce their lists of the names of the immigrants who had been attacked with cholera since its first outbreak during the present year. I then proceeded to take down evidence from them as to the name, age, sex, native country, and destination of each immigrant, and also as to the symptoms from which each suffered.

4. The statements thus obtained form the substance of my diary of inspection, which is hereto annexed, while the several stations inspected by me in the course of my inquiry are indicated in the

maps attached to the diary and the position of each place where cholera appeared as well as of other places to which reference is made in the diary being shown by certain marks.*

5. I communicated also on the several points of this inquiry with the medical practitioners employed by Government on this line of road.

6. It appears that the first cases of cholera, on the Central and Mannar Matakachchee roads, all occurred on the same day, the 3rd of June last, in three individuals, namely, two immigrants and one patrol. It seems that a party of four coolies coming from Pudoocotta, on the coast of India, took shelter in the cooly shed at Periacatto, on the Mannar Matakachchee road, twenty-nine miles from Mannar, on the day referred to, on which day the patrol of the shed was attacked with cholera in the morning, as also one of the four coolies, a woman who had come from Pudoocotta, named Camachy, who was discovered having cholera symptoms on her while cooking her breakfast, and who died at 5 P.M. of the same day. The patrol, Periatamby, also died about the same time.

7. Before the arrival of the coolies no cholera had existed in the place since the beginning of the year, and the only conclusion to be drawn is that they had communicated the infection, a conclusion which is strengthened by the following fact.

8. The first case on the central road occurred on the same day and in the same month, the 3rd of June, at Marudenheedaveli, 136 miles from Jaffna, in the person of a female immigrant who was one of a gang of in-coming coolies. This leads me to believe that these immigrants, as well as those referred to in the preceding paragraph, had all come from one and the same infected locality, one party being in advance of the other.

9. Cholera next appeared at Teempanne, 128½ miles from Jaffna (intermediate between the two last stations), on the 4th of June. The patient in this case also was an in-coming immigrant, a mason, and a native of the same place in India, Pudoocotta. It would thus seem decisive that the disease was imported in all the foregoing cases from the locality above-mentioned, namely, Pudoocotta.†

10. On the 7th June an in-coming cooly from Salaputty, near Trichinopoly, and another belonging to the same gang were attacked with cholera at Allagamowa, 146 miles from Jaffna, but they both recovered, and were able to proceed to Kandy on the 11th of the month. The appearance of cholera at this station led to the infection being communicated, first, to the patrol who attended on the sick coolies, and next to a little girl who lived in the patrol's house, and then to his wife. In all these three cases the disease proved fatal.

11. The next appearance of cholera was at Matakachchee, 106½ miles from Jaffna, a principal station where the in-coming and out-going coolies meet. The first case here was that of a Moorish girl, who lived in the bazaar and who had sold certain articles the night preceding to immigrant coolies who had then arrived. She was attacked on the 11th June and died on the same day. Another case occurred on the 13th in the bazaar at the station, that of a dhoby who was living near the bazaar where the first fatal case appeared. A third fatal case occurred on the 13th in a road cooly, who also lived in the bazaar.

12. The bazaar people and the immigrants who halt at Matakachchee, resort to a stream which issues from the tank in the place, and which runs close to the road, for the purposes of bathing, washing their clothes, and for providing themselves with water for drinking and cooking. It is, therefore, most probable that the contagious poison was communicated, in these instances, either by the water so indiscriminately used, or by intercourse with the coolies.

13. Another instance of infection appeared, on the 13th June, in a party of three Telegraph coolies. They were employed for some time on the central road where cholera had broken out since the 3rd instant, lodging in the bungalows occupied by the coolies. They had been in perfect health, till two of them were attacked with the disease when returning to Mannar, at a place called Callycattocaddo, which is about eight miles distant from that station.

14. One died, and the other recovered.

15. On the 14th of June a case occurred at Osylancolom, 8½ miles from Mannar, in the person of a woman named Cavenpay, an out-going cooly, who died in the night. She was accompanied by about six coolies, who had been travelling through the infected cooly stations.

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* These maps are *not printed.*

† I have no information as to the progress of Cholera in the Independent State of Pudoocottah, but as the Trichinopoly, Madura, and Tanjore Districts surrounding it suffered from the invasion, I infer that Pudoocottah suffered too.—(W. R. C.)

16. On the 14th June of a gang of fifty coolies coming from the coast of India, one was attacked with the disease at a place called Kalaar or Chetty Colom, about twelve miles from Maan Colom (forty-three miles from Mannar), to which station the patient was brought. He died on the same day.

17. At Marnden Colom, 117 miles from Jaffna, the first casc occurred in an in-coming cooly who was admitted into the hospital on the 15th June, and recovered.

18. At Mehintale, $119\frac{1}{4}$ miles from Jaffna, on the 15th June, an Arab trader and a cooly girl coming from India were attacked with cholera and were attended by the medical practitioner, and recovcred.

19. On the 16th June at Matakachchee, two immigrants from the coast were brought by their friends to the hospital and given in chargc of the cangany and patrols; one of the patients had come from Palamcottah, and the other from Aranthangy. Both cases proved fatal.

20. Four other cases were also admitted on the 17th Juné; the patients were immigrants from India. All of them had been seen by the medical practitioner, who gave me this information. Three of the cases terminated fatally.

21. On the 18th June, at Rambave, 112 miles from Jaffna, two fatal cases occurred among the in-coming coolies. Both were found dead on the roadside, and their names and whence they had come were ascertained from the mother and wife of the deceased.

22. Another fatal case occurred in an immigrant from thc coast at Gulcolom, $125\frac{1}{2}$ miles from Jaffna. The patient was seen by Mr. Fretz, Superintending Officer of the Roads, who gave me this information.

23. On the 18th June, at Alagamowa, a cooly coming from the coast was seized with the disease, and was treated in hospital and recovered on the 21st instant, and proceeded to a coffee estate named Nagalwatte, in Matale.

24. The disease next appeared, on the 20th June, on the Mannar road at Pulliadurakum, twenty-three miles from Mannar, among an in-coming gang of fifty coolies, natives of Pudoocotta and Perrambacuddy or Carambacuddy, in Sevagunga, near Madura. Two were attacked and recovered.

25. On the 22nd of thc month, at the same station, of a gang of thirty coolies coming from Wellasally, on the coast, a girl aged 12 was attacked and died. Her brother, who accompanied her gave the patrol this information.

26. At Pesalle, on the 23rd June, two *out-going* coolies were seized with the disease, one died and the other recovered and proceeded to the coast.

27. The disease appeared on the central road, at Terupanne, on the 23rd June, in two coolies, who came from Salaputty and Nerraoor, near Trichinopoly. One died.

28. On the same day, at Matakachchee, an in-coming cooly was carried affected with the cholera to the shed by some of the gang and given in charge to the cangany. The case proved fatal.

29. On the following day, 24th June, a child was found dead close to the station, supposed to have died of cholera.

30. On the 24th, at Marudenkeedaveli, two Moorish traders from India were seized with the disease and died. They were on their way to Matalé.

31. On the 27th of the month, an in-coming cooly was found dead at Maan Colom, supposed to have died of cholera.

32. On the same day, a Singhalese, who was returning from Anuradhapura, was seized with the disease on the road to Maroodencuda, and was brought to the hospital at that station and died.

33. On the 28th, two coolies coming from the coast, and both of them natives of Sevagunga were admitted into the hospital at Terupanne with the disease, but recovered.

34. At Pesallc, on the same day, a cooly, who landed from the Brig *Reheymain*, had choleraic diarrhœa and recovercd.

35. On the Mannar road, on the 29th June, at Kombensange Colom, eighteen miles from Mannar, a fatal case occurred in a cooly who was coming from the coast.

36. On the same day, on the central road at Marudenkecdaveli, an *out-going* cooly was seized with cholera, and died on the 30th.

37. On the same day, at Terupanne, a cooly girl coming from Sevagunga, in India, was attacked and recovered.

38. On the same day, at Matakachchee, an immigrant coming from Mannar was found dead near the 110th mile. It is supposed that he died of cholera.

39. On thc 2nd July, at Marudenkeedaveli, two immigrants coming from India were attacked with the disease. One died, and the other recovcred.

40. On the same day, at Alagamowa, the next station, an immigrant cooly was brought into hospital from a distance of two miles. He recovered, and proceeded to Kandy. On the 11th instant, at the same station, a cooly coming from the coast was attacked and recovered, and proceeded to Kandy.

41. At Kombensange Colom, nineteen miles from Mannar, on the 27th July, a cooly coming from the coast was found dead on the road. He belonged to a gang of fifty coolies, who had slept in the shed the previous night. From the deceased's appearance there was no doubt that he had died of cholera.

42. From the above statement of facts, elicited during the course of my inquiry, it appears, beyond the shadow of a doubt, that cholera had not existed on the Mannar and central roads previous to the third day of June last, when the disease first appeared, having been introduced by the immigrant coolies, who had come from India from a place called Pudoocotta, successive gangs as they moved along propagating the infection in the several stations above-mentioned.

43. It appears, also, from the records kept at the port of Pesalle by the Health Officer, that the arrivals during June were very numerous, no less than 8,755 immigrants having arrived in that month, who, travelling in detached parties, became the means of introducing the disease along the whole line of road leading to the Central Province.

44. It is also a fact that the coolies, on their arrival at the port, quickly move on to the stations provided for them; and, from what I have ascertained, I find that some of them have been able to reach Matakachchee, a distance of fifty-two miles, on the third day. They arrive at the port apparently in good health, but with the disease in a state of incubation; and, as they proceed on their journey, performed very often by hasty stages, the cold and damp of a jungle country, sleeping on the road side at night, without protection against malarious influences, unwholesome food and water, absence of all cleanliness, these and such like causes tend to develope the germs of the disease with which they are already impregnated, and which breaks out generally at periods varying from two to five days of their arrival in Ceylon.

45. The immigrant coolies who suffer from cholera, during their journey, infect not only the passengers and cartmen whom they meet on their way, but the bazaar people also at the different stations at which they arrive, whereby they create, as it were, so many centres from which the disease spreads from the central road, by successive outbreaks, into the province.

46. I find that, of coolies returning from Kandy, a very small proportion, amounting to only *four* in number, were affected with the disease (out of an aggregate of sixty-three attacked), having become infected on their journey by intercourse with the in-coming immigrants, among whom the first outbreak on the Mannar and central roads occurred so early as on the 3rd June, in which month the largest arrivals from India took place, as already stated.

47. I would further observe that coolies returning from Kandy, receiving the infection from their in-coming fellow-countrymen, whom they meet with on the road, and with whom they freely mix, are not unlikely to carry with them the seeds of the disease to their native land, which may account for the fact of the cholera having appeared at Davipatam among the passengers from Pesalle, the disease not existing at the time at Davipatam.

48. From inquiries I made at Mannar, from the oldest inhabitants of the place, it appears that cholera was introduced among them originally by natives of India crossing over to Talamannar, whence the tappal formerly passed over to Tinnycuddy, in Ramisseram and India. Passengers to Ceylon came by the tappal boats by the same route, as also pilgrims from India, by whom the disease was brought into Talamannar, whence it spread to Pesalle and to the town of Mannar, passing on to Vengala and other places on the mainland. Mr. Bulner, who was Sub-Collector at Talamannar from 1849 to 1859, informs me that it was the general belief that the Indian coolies and pilgrims were instrumental in importing this fatal disease. Gangs of coolies first commenced to come over to Ceylon in 1837. Mr. Bulner recollects that in 1843 cholera first made its appearance at Talamannar with the immigrant coolies proceeding to Kandy, and that it prevailed subsequently in an epidemic form. Coolies had been passing backwards and forwards through Mannar for upwards of thirty years, but no measures were adopted for their protection till 1862, when the immigration service was organized by Government.

49. In consequence of the introduction of cholera, the population in several villages in the vicinity of Mannar has been considerably reduced in number, as testified to by the Assistant Government Agent of Mannar in a communication addressed to the Jaffna Cholera Commissioners, dated

15th April 1867. I quote his own words. Mr. Twynam says, "Year after year has sickness been introduced by the immigrant coolies, and village after village has died out, or been so reduced that only one or two families remain, and the country, for some distance on each side of the Mannar Madawaratchy road, in the Mannar District, is fast becoming a desert."

50. I must confess that I regard with some degree of surprise that any question should have been raised by the authorities in India as to the importation of cholera into India from Ceylon, when it is universally acknowledged in this province that the disease is brought from the coast of India, the birth-place and head-quarters of cholera.*

51. The Cholera Commission appointed by His Excellency the Governor on the 3rd March 1867 to inquire into, and report upon, the causes which led to the outbreak of cholera in the Jaffna Peninsula, after an extended inquiry express themselves in the following terms : "We have established beyond doubt the facts of its having been introduced into the Peninsula from India, both directly by sea and more circuitously by the central road, and of its having spread from village to village by human intercourse, thus confirming the opinion, now generally entertained, respecting the transmissibility and mode of propagation of cholera."

Interchange of sanitary reports between Ceylon and Madras Governments.

80. One result of the recent cholera invasion of Ceylon, has been to establish an interchange of reports on public health between the Madras and Ceylon Governments. I now furnish a bi-monthly statement of cholera prevalence in the Southern Districts to the Ceylon Government, and receive in return any information which that Government possesses on the condition of cholera in Ceylon.

In this way I am now in a position to warn the Ceylon authorities of the probable course of an epidemic, and to receive in return any information on points of importance to the population of our Southern Districts.

Influence of new soil and climatic conditions in developing infective properties of cholera contagium.

81. There is one fact in regard to the extension of cholera to Ceylon that I must briefly dwell upon, as illustrative of a peculiar feature of the disease. It is this, that the peculiar contagium of the disease, whatever it may be, appears to have become more vigorous in its action after it had been taken to the foreign soil of Ceylon, and had been brought back again by returning coolies to the port of Davipatam.

We have seen that cholera became active on the Immigration roads in Ceylon early in June, and about the end of that month a batch of return coolies were landed at the port of Davipatam, six of whom had died of cholera on boardship, before landing. From this centre, Captain Guthrie the Superintendent of Police at Madura, a very careful and intelligent observer of cholera phenomena, declares that "cholera spread in lines clearly traced by the various main roads throughout the Zemindaries of Ramnad and Shevagunga." From an examination of the Police reports, there can be no doubt that cholera did about this time appear in renewed vigour in the southern portion of the Madura District, and there seems some reason to suppose that the outbreak in the town of Madura in August was due to pilgrims who had entered the town by the southern road, along which cholera had set in with vigour, after the dispersion of the return coolies from Ceylon. Although there are not the slightest grounds for imputing to Ceylon the *origin* of the recent cholera epidemic, yet it is quite consistent with all that we know of the natural history of cholera, to suppose that the germs of the disease gathered new strength in a soil that was not the breeding place of the

* The question was only raised incidentally in regard to a virulent cholera at Davipatam amongst returned emigrants. It is an undoubted fact that Ceylon is always invaded from India, and that it has no epidemic cholera of its own capable of affecting other countries.—(W. R. C.)

epidemic. The districts of the north-west of India do not breed cholera, and yet when the seeds of the disease are periodically introduced into those districts, cholera flourishes with a vigour unknown within the true endemic region of Lower Bengal.

Past epidemic invasions of Ceylon.

82. While this report was passing through the Press, I received from the Principal Medical Officer of Ceylon the following letter and statement regarding the years of greatest prevalence of cholera in the Island since 1859. It will be observed that the 1859 invasion did not reach Ceylon until 1860, and that the 1863 invasion reached the I sland, as it did the Western Coast of India, in 1864. The 1869 invasion did not get to Ceylon until May 1870.

From the Principal Civil Medical Officer, Colombo, to the Sanitary Commissioner, Madras, dated Colombo, 16th February 1871.

In reply to your letter of the 14th December, requesting me to furnish you with any data in my office showing the monthly prevalence of cholera in the Island of Ceylon from the year 1859 to the end of 1870, I regret to have the honour to state that the forms of Cholera Registers adopted in this department are so voluminous that, without an additional staff of clerks which are not at my disposal, I am unable to afford you the information in a monthly form.

I have, however, drawn up a form of return which I trust may, to a certain extent, answer the object you have in view.

This return gives the number of cases and deaths reported in each province of the Island from 1859 to 1870 inclusive, together with the date and locality of the first and last case occurring in each year in every province.

You will observe that the Northern and Central provinces are the most obnoxious to cholera, and these two provinces are chiefly affected by importations from India.

It is, however, in the Northern Province alone that cholera is in the habit of locating itself, and the history of every outbreak, I believe without exception, points to India as its origin, the infection having, in every instance, been imported direct.

The climate of the Northern Province assimilates to that of Southern India. Its people are all Tamils, and resemble the inhabitants of Southern India in their habits, customs, and constitutional peculiarities, and they are in constant and close communication with them.

A cholera epidemic seldom prevails in the south of India without establishing itself in the peninsula of Jaffna and at Mannar, and from thence it is conveyed along the central road, the tract of the immigrant coolies into the Central Province.

The whole of the localities indicated in this return in the Northern and Central Provinces are liable to infection by gangs of coolies passing into the interior from the coast of India. As compared with the returns from India the total number of cases occurring in the remaining provinces of Ceylon is very small.

The disease has occasionally occurred spontaneously towards the south of the Island, but it can scarcely be said to have become epidemic excepting in the Northern Province, and seldom exhibits any tendency to diffuse itself much beyond the locality of its first appearance.

The Northern Province is at all times favourable to the rapid spread of the disease, and in uncertain periods of time, it assumes a malignity which seriously affects the population.

In the years 1866 and 1867 more than 20,000 cases occurred, which led to a Commission being appointed by the Government to inquire into its causes, and a long report was the result, a copy of which I will endeavour to have forwarded to you.

It will afford me much pleasure if I can offer you any further information on the subject.

Table showing the Number of Cases of Cholera and Number of Deaths which have occurred in the Island of Ceylon, from the year 1859 to 1870 inclusive; also the Date and Locality of the first Case in each Province, and the Date and Locality of the last Case in each Province in each year.

Years.	Western Province. Number of Cases.	Number of Deaths.	Date of First Case.	Its Locality.	Date of Last Case.	Its Locality.	North Western Province. Number of Cases.	Number of Deaths.	Date of First Case.	Its Locality.	Date of Last Case.	Its Locality.	Southern Province. Number of Cases.	Number of Deaths.	Date of First Case.	Its Locality.	Date of Last Case.	Its Locality.	Total No. of Cases.	Total No. of Deaths
1859...	165	105	*	...	...	...	13	16	...	...	...	...	57	18	...	...	...	...		
1860...	122	94	Sept. 4th.	Colombo ...	Dec. 30th.	Negombo ...	497	361	April 6th.	Calpentyn.	Dec. 29th.	Rurunegala	...	...	...	...	...	...		
1861...	98	68	Jau. 2nd.	Negombo ...	Mar 29th	Colombo ...	...	...	...	...	...	...	1	1	...	Hambantota ...	...	...		
1862...	13	11	Feb. 4th.	Colombo ...	Dec. 22nd.	Do. ...	21	19	May 2nd.	Puttalam...	Sept. 24th.	Puttalam...	194	89	Aug. 5th.	Galle ...	Oct. 13th	Galle.		
1863...	4	3	Jan. 19th.	Ambanpitta ...	Sept. 19th.	Ambaupitta ...	...	...	...	...	...	...	...	...	...	...	...	...		
1864...	287	191	Jan. 27th.	Colombo ...	Dec. 30th.	Colombo ...	38	31	July 31st.	Puttalam...	Sept. 21st.	Puttalam...	6	4	Aug. 26th.	Calloowelle near Galle.	Aug. 31st.	Calloowelle near Galle.		
1865...	252	193	Jan. 9th.	Do. ...	Dec. 31st.	Do. ...	149	100	June 9th	Do. ..	Nov. 3rd.	Do. ..	212	101	Feb. 26th.	Rarawe near Galle.	June 11th.	Galle.		
1866...	225	151	Jan. 2nd.	Do. ...	Do. ...	Negombo ...	274	194	Sept. 29th.	Chilaw ...	Dec. 29th.	Chilaw ...	114	63	Aug. 8th.	Calloowelle near Galle.	Dec. 31st.	Hambantota.		
1867...	34	15	Jan. 2nd.	Negombo ...	April 19th.	Colombo ...	11	10	Jan. 2nd.	Do. ...	Jan 15th.	Do. ..	16	3	Jan. 1st.	Hambantota ...	Jan. 7th.	Do.		
1868...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
1869...	2	...	Nov. 17th.	Regalle ...	Nov. 18th.	Regalle ...	...	...	...	...	...	...	...	...	...	...	...	...		
1870...	43	29	Juno 15th.	Colombo ...	Dec. 28th.	Colombo ...	1	1	June 30th.	Rurunegala	...	...	190	84	May 16th.	Calloowelle near Galle.	Aug. 24th.	Galle.		
	Eastern Province.						**Northern Province.**						**Central Province.**						**Total No. of Cases.**	**Total No. of Deaths**
1859...	...	...	...	...	...	...	158	122	...	...	...	...	63	50	...	......	...	...	456	305
1860...	65	42	Nov. 15th	Batticaloa ...	Dec. 23rd.	Batticaloa ...	1,256	847	April 23rd.	Mannar ...	Nov. 14th.	Mannar ...	245	177	April 16th.	Randy ...	Dec. 31st.	Randy ...	2,185	1,521
1861...	4	2	Jan. 1st.	Do. ...	Jan. 3rd.	Do. ...	...	...	...	...	...	...	76	62	Jan. 1st.	Do. ...	Feb. 18th.	Do. ...	179	133
1862...	41	14	July 28th.	Tamankadua ...	Aug. 25th.	Tamankadua ...	2,129	1,233	Feb. 25th.	Jaffna ...	Nov. 1st.	Mannar ...	196	122	April 30th.	Do. ...	Nov. 30th.	Matale ...	2,594	1,488
1863...	...	...	...	...	...	...	3	2	Mar. 2nd.	Arippo ...	Mar. 22nd.	Arippo ...	12	1	Jan. 17th.	Do. ...	Nov. 20th.	Matale on Cenral Road.	19	6
1864...	283	179	Feb. 24th.	Trincomalee ...	Dec. 31st.	Trincomalee ...	2,325	1,339	Feb. 6th.	Vangalie...	Dec. 25th.	Mannar ...	639	413	Feb. 24th.	Damboloya on Central Road.	Nov. 21st.	Matale ...	3,578	2,157
1865...	551	309	Jan. 2ud.	Do. ...	Dec. 27th.	Batticaloa ...	1,221	653	Mar. 24th.	Do. ...	Dec. 1st.	Do. ...	343	229	Mar. 12th.	Randy ...	Dec. 31st.	Mihintale on Central Road.	2,728	1,585
1866...	51	20	Jan. 3rd.	Batticaloa ...	Dec. 9th.	Do. ...	9,092	4,988	Jan. 28th.	Do. ...	Dec. 31st.	Rayts ...	785	510	April 28th.	Dambulla ...	Dec. 19th.	Randy ...	10,541	5,926
1867...	...	...	...	...	...	...	10,116	6,862	Jan. 1st.	Jaffna ...	Nov. 29th.	Mullatiore.	16	14	Feb. 8th.	Mihintale ...	Sept. 15th.	Dambulla ...	10,193	6,904
1868...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	May 3rd.	Randy ...	...	...	2	1
1869...	...	...	...	...	...	...	2	1	Sept. 13th.	Jaffna ...	Sept. 19th.	Jaffna ...	9	4	Aug. 1st.	Lunugalla on Central Road.	Nov. 23rd.	Randy ...	13	5
1870...	9	5	July 17th.	Batticaloa ...	Aug. 4th.	Batticaloa ...	214	124	June 1st.	Mannar ...	Dec. 27th.	Mihintale...	87	65	May 18th.	Badulla ..	Nov. 2nd.	Do. ...	544	308

* The Cholera Registers of 1859 have been mislaid, and the information cannot, in consequence, be furnished.

EXTENSION OF CHOLERA TO TRAVANCORE.

83. I have already alluded to the circumstance that the cholera epidemic passed into Travancore, and that its progress in this direction was arrested by the mountain barrier existing between Tinnevelly and Travancore—a barrier rising in some parts to 4,000 or 5,000 feet in height, the higher plateaus consisting of dense forests, some portions of which are not only uninhabited, but, to this day, have never been explored.

It bears strongly on the question of the movement of cholera, that a barrier of this nature should cut off cholera completely from an adjoining district, and that invasion should occur only in places where the barrier is weak (*i. e.*, by a mountainous pass, or highway for human intercourse) or altogether wanting, as at the extreme south of the district where the coast lines of Travancore and Tinnevelly are continuous. I have received no detailed account of the general progress of cholera in Travancore, though such has been promised by the Physician to His Highness the Maharajah of Travancore, who meanwhile has favoured me with the following "conclusions" from the facts before him:—

Report of Physician to the Maharajah of Travancore.

"1*st.*—The disease invaded Travancore from Tinnevelly through the Arambooli Pass, and by the plain to the south of the end of the ghaut line, and lying between it and the sea."

"2*nd.*—It spread following the streams of human intercourse." [With reference to this I may remark that it pursued generally a northward course up the Western Coast. It only reached the latitude of Cannanore in any force about the end of January 1871.]

"3*rd.*—In almost every case occurring in Trevandrum, the origin of the disease was traced to contact or approach either to infected persons, or persons who had been in contact with, or in the neighbourhood of, persons suffering from the disease.

"4*th.*—It was in no way affected by the aerial currents, by the weight of the column of air, nor (in Trevandrum) by the occurrence of heavy rain."

"5*th.*—The presence of abundant organic matter intensified the disease greatly."

CHOLERA IN MALABAR.

84. By the end of the year cholera had advanced through the Travancore and Cochin States, and had become prevalent on the banks of the Ponnany river, and had extended up the coast so far north as Cannanore. In some few villages the epidemic caused considerable mortality, but it was not very fatal to the general population. The Palghaut Talook lying under the mountains of the Western Ghauts suffered more than any other part of the district and here the disease became active early in the year. A report from the Collector of Malabar on an outbreak in a fishing village near Quilandy is appended. The question as to the influence of a fish diet in the production of a choleraic type of diarrhœa, and the connexion between the mortality of fish on the coast and the ordinary coast cholera, is here opened up, but the facts are still under investigation, and I shall defer commenting upon them until another opportunity.

Fish diet & Cholera.

The following table will show the particulars of cholera mortality in each talook of Malabar :—

Return showing the Monthly Cholera Mortality in each Talook of the Malabar District, during 1870.

—	Cannanore Municipal Town.		Cherical Talook, N. of District.			Tellicherry Municipal Town, W. of Talook.		Kottyam Talook, N. of District.			Wynaad Talook, N.E. of District.		
Population ...	6,011		214,612			17,726		122,789			56,603		
Total No. of Villages in each Circle.	—		317			—		248			83		
Months.	Population.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January ...		...	...	...	...		...	...	...	...	...	...	...
February ...		...	...	...	...		...	...	...	...	...	...	...
March ...		...	...	...	...		...	1	2,249	1	1	6,183	1
April ...		...	...	...	...		...	...	...	...	...	...	...
May ...		...	...	...	...		...	...	...	...	...	...	...
June ...	6,011	...	...	...	...	17,726	...	...	...	...	...	...	...
July ...		...	3	8,765	3		...	...	...	...	...	...	...
August ...		...	...	...	...		...	...	...	...	...	...	...
September ...		...	...	...	...		...	...	...	...	1	2,452	2
October ...		...	...	...	...		...	...	...	...	...	...	...
November ...		...	2	9,065	5		...	1	2,249	1	...	...	...
December ...		11	6	36,262	16		...	1	5,603	1	...	...	...
Total ...	—	11	-	—	24	—	-	-	—	3	-	—	3

—	Kurumbranad Talook, Centre of District.			Calicut Municipal Town, Centre of Talook.		Calicut Talook, Centre of District.			Ernaad Talook, Centre of District.			Valawanad Talook, S. E. of District.		
Population ...	203,549			36,602		123,798			240,675			246,752		
Total No. of Villages in each Circle.	411			—		234			350			564		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January ...	1	2,464	1		...	...	...	...	1	6,612	3	1	3,823	1
February ...	...	...	...		...	...	...	...	2	10,375	2	1	6,335	1
March ...	...	...	...		...	...	...	...	...	...	...	3	15,205	3
April ...	...	...	...		...	1	5,188	1	3	10,939	5	2	7,089	3
May ...	...	...	...		...	2	9,191	2	2	9,552	2	...	...	...
June ...	...	...	...	36,602	...	...	...	...	6	27,628	7	2	11,561	12
July ...	...	...	...		...	...	...	...	...	...	...	2	7,934	8
August ...	...	...	...		...	...	...	...	1	7,448	4	2	9,096	5
September ...	...	...	...		...	...	...	...	3	17,581	6	5	16,926	13
October ...	1	6,309	1		...	1	3,453	1	3	18,768	5	6	21,588	12
November ...	9	41,946	32		...	...	...	...	2	10,921	3	6	22,234	23
December ...	2	8,781	10		...	...	...	...	3	13,515	13	5	18,662	14
Total ...	-	—	44	—	-	-	—	4	-	—	50	-	—	95

—	Palghaut Municipal Town, S.E. of Talook.		Palghaut Talook, S. E. of District.			Ponnany Talook, S. of District.			Cochin Municipal Town, S. of Talook.		Cochin Talook, S. of District.			Zemindaries		
Population ...	27,533		251,770			310,131			9,940		1,183			3,868		
Total No. of Villages in each Circle.	—		233			586			—		2			—		
Months.	Population.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	Population.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January ...		...	...	...	...	2	10,047	3		...	...	...	...	...	...	...
February ...		...	1	7,985	1	1	6,210	3		...	...	...	...	...	...	...
March ...		1	7	36,912	21	1	6,210	4		...	...	...	...	...	...	...
April ...		1	13	67,679	23	2	8,860	2		...	...	...	...	.	...	...
May ...		16	12	48,622	57	1	...	...		...	...	...	...	...	...	...
June ...	27,533	28	33	1,43,470	151	1	4,973	1	9,940	...	...	...	...	...	...	...
July ...		21	16	85,427	91	10	41,421	27		...	...	...	...	...	...	...
August ...		31	18	97,565	62	29	1,12,939	116		...	...	...	...	...	...	...
September ...		16	7	37,616	18	15	65,252	48		...	...	...	...	...	...	...
October ...		7	6	25,219	27	12	43,812	57		...	...	...	...	...	...	...
November ...		...	7	37,755	17	13	59,219	57		3	...	...	...	...	...	...
December ...		...	13	66,343	85	17	78,421	261		1	1	1,183	2	1	2,215	7
Total ...	—	121	-	—	553	-	—	579	--	4	-	—	2	-	—	-

From the Magistrate of Malabar, to the Acting Secretary to the Board of Revenue, dated Vytry, 2nd December 1870, *No.* 398.

I have the honour to inform you that, on the 3rd November, a case of cholera occurred in the village of Kollam, close to Quilandy, on the Calicut and Cannanore road.

2. A detachment of Europeans had that day started for Calicut, via Quilandy, and I accordingly informed the Brigadier, who halted the detachment at Tellicherry.

3. Further reports showed that the disease had assumed at this place an epidemic form, and I obtained daily reports from my Dresser, whom I had at once despatched to the spot with a supply of medicines. The disease showing a tendency to spread towards the north, additional assistance in the way of Dressers was obtained, and I am now glad to say that its progress appears to have been checked.

4. I forward a report, dated 26th November 1870, No. 1,104, from the Sub-Collector, in whose division the locality is, together with a memorandum, drawn up by the Civil Surgeon of Tellicherry, who accompanied him on a tour of inspection of the locality.

5. It will be seen that the origin of the outbreak is doubtful; the fact that pilgrims from the south halt close to the spot, indicating that in this way the disease may have been communicated.

6. It will be observed that the attacks are thought to have been brought on by eating sardines, and I addressed the Sanitary Commissioner on the subject. I enclose copy of his reply, dated 25th November 1870, No. 1,112. It will be observed that he points out that Travancore and Native Cochin have been for some months visited by epidemic cholera, undoubtedly a continuation of the disease as it affected Madura and Tinnevelly, and he is inclined to suspect that this outbreak is a further sweep of the same wave of disease.

7. I am making inquiries as to the mortality of fish along the coast this season, and will communicate with the Sanitary Commissioner on the subject.

8. By some, cholera is traced to the manufacture of fish-oil, which is carried on to a great extent, whenever, as in the present season, large takes of sardines occur.

9. I do not, however, consider that we have established facts before us such as would justify a prohibition of this manufacture in its ordinary form, considering the great loss that would be entailed on a poor section of the community by such a prohibition. Orders have been issued that all care should be taken in disposing of the refuse in such a manner as to cause as little annoyance as possible.

10. In the present case, the Sub-Magistrate of Quilandy showed promptitude and judgment, and the village officers acted well, in spite of the panic that prevailed among the villagers.

11. The Collector's Dresser has also done good service, and his presence seems to have been very effectual in re-assuring the people and encouraging them to assist their relatives to combat the disease.

From the Joint Magistrate of Malabar, to the Magistrate of Malabar, dated Tellicherry, 26th November 1870, *No.* 1,104.

In continuation of my letter, No. 1,067, dated 16th instant, regarding the outbreak of cholera in Kurumbranad Talook, I have the honour to inform you that, at my request, the Zillah Surgeon accompanied me in a tour through the infected parts on Monday and Tuesday last.

2. I enclose copies of the remarks with which Dr. McAllum has favoured me, also of lists of the houses and of the people who had been attacked by the disease up to the day of our visit to Quilandy, and of a plan showing the position of the houses at Kollam.

3. The disease broke out at Kollam Deshom of the Viyoor Amshom on the 3rd instant. It attacked an old woman who succumbed to it next day. The lists will show how it spread to neighbouring houses and to people at a distance related to those living at Kollam. The disease assumed a very virulent and infectious type at Kollam, as proved by the number of deaths among those attacked there, and among those who there caught the infection. Out of twenty-three attacked, fourteen died. Elsewhere the disease was not infectious, and seems to have been confined to persons, who, it is universally asserted in those parts, brought it on by partaking too freely of " Mathi Meen" (Sardine) the oily fish that is so common on the coast this year, or of " Pullinra nella" (straw paddy). The latter is the refuse paddy collected from the straw when it is threshed a second time. At the first threshing all the good grain is taken out and the straw is then thrown aside in heaps, and I suppose the pullinra nella (the grain still adhering to the damp straw) undergoes a process of fermentation which causes it to become unwholesome. The grains are generally quite black, and

crumble up into powder without much pressure.* This grain is given only to coolies and the Palayans who work in the fields, and it is universally considered unwholesome.

4. Dr. McAllum seems to think that the outbreak at Kollam was due to the same cause, viz., the people eating this unwholesome fish and grain; but that, in my opinion, scarcely accounts for the maglinant type the disease took. We have procured specimens of water from the wells of the houses at Kollam, and Dr. McAllum is sending them to Madras to be tested. The analysis may disclose something with which we are not yet acquainted. However, it is clear that the disease originated in a house only a few feet off the coast road, and within 200 or 300 yards from a place where pilgrims are in the habit of halting on their way northwards by this route. The survivors in the house will not admit that they ate the "Mathe Meen" or "Pullinra nella," and it was only surmised by the Adigari and others that such food had been eaten. The house and its surroundings are clean and as airy as the generality of houses in this district. I observe that the disease spread at once, the second case occurred on the day the first woman died. Now, if it had been merely a case of indigestion followed by vomiting and purging as elsewhere, the disease would, I think, have scarcely spread so fast, even supposing that no care whatever was taken to remove the cholera discharges of the first patient. Elsewhere than at Kollam, the disease does not seem to have spread by infection. On the whole, I am disposed to think, though there is no direct evidence on the point, that the seeds of the disease were brought by pilgrims. Many, as I have already noticed in a previous letter, have lately been passing up north through the district, and it is quite possible that the disease may have been communicated by one of them. It is only a few steps off the road to No. 1 house. It is true no case of cholera has been brought to notice among the pilgrims, but it is well known it can be communicated by a person who is himself quite free from the disease.

5. Only two persons, both in a fair way of recovery, were lying ill when we visited Kollam, and no fresh cases have occurred there since.

6. Cases of what Dr. McAllum calls sporadic cholera have occurred over a wide tract of country, almost from the foot of the ghauts near Kuttiadi (Paleri Amshom) to the sea. Treatment of these cases, when taken in time, seems to have been successful. Other cases are to-day reported in Maniyur Amshom, north of the Kota river, which runs into the sea south of Badagerra. My orders to the Tahsildars are to move a Dresser at once to any place where the disease tends to become local and infectious. The central stations fixed for the four Dressers are at present—1, Kollam; 2, Mowral bridge on the coast road; 3, Pyolli; and 4, Kottiadi, Nos. 2, 3, and 4 being on the Kota river. If no fresh cases occur at Kollam, the Dresser there is to be moved to Badagerra, near which a case has been reported to-day.

7. Great fear prevailed at Kollam, and this undoubtedly tended to spread the disease. The house No. 5, in which there was most fear, suffered most; the head of the family left, and would not return to it till our arrival. It was the only house we saw where the rules, of which I sent you a copy, had not been properly carried out. The arrival of your Dresser, of whom favourable notice is taken by Dr. McAllum, seemed to have had an excellent effect in the locality. The Quilandy Sub Magistrate, the Dresser, and the Adigari of Viyoor Amshom all did their duty well; the former, by giving timely notice of the outbreak, probably saved the detachment of the 1st Battalion 21st Europeans, then on its march down the coast road, from an attack. But for the timely warning, the detachment would have marched through Kollam within a few yards of the infected houses when the disease was at its worst.

8. The Cherikal Tahsildar has reported three or four deaths on the Cannanore and Coorg road, but his report is very indefinite, and further information has been called for.

Dr. McAllum's Report on the outbreak of Cholera at Kollam in the Viyoor Amshom.

On the 21st instant I accompanied Mr. W. Logan, C.S., Sub-Collector, Malabar, to visit the village of Kollam in the Viyoor Amshom, where there had been several cases of cholera. On our way there, we visited Mowral and Pyolli, at each of which places an Hospital Assistant is stationed, as two or three isolated cases had been reported. At our visit, no fresh cases had been reported. The place was clean, and attention was paid to the sanitary instructions sent out. The Assistant at the former place, Mowral, has strict orders to inspect all pilgrims and bandies with families in them, and, if necessary, in cases of illness, to detain the people, and have the clothes, &c., washed and fumigated with sulphurous acid. The village of Kollam we found clean, and the compounds of the various houses kept in good order. The disease, in my opinion, first broke out in a sporadic form, as the first patient had

* Specimens of this diseased grain will be examined microscopically and reported upon hereafter.—(W. R. C.)

not been either out of the village, or in contact with any one that had had cholera. The attack is supposed to have originated from the patient having partaken largely of "Mathi meen," as, during the night, she was seized with vomiting, subsequently purging, collapse and death on the following day. From this solitary case, the disease seems to have assumed an epidemic character; though, I have no doubt, that all who subsequently were attacked were more or less rendered liable to attack from having partaken of that fish, as also of straw paddy; the latter a fermented rice. From the nominal roll of the cases attacked, it will be seen that nearly all, at least the majority of all subsequently attacked, are in some way connected by family ties with No. 1 patient. I think there can be no doubt that in several of the cases the disease was communicated by *infection*. The greater number of the infected houses are close to each other, some only being divided by a compound and a road. House No. 6 is in the direct line of the sea breeze, and not 150 yards from house No. 1. This patient denies having partaken of the "*Mathi meen*," and also of having had any communication with any of the other houses; but I am inclined to doubt the truth of the statement. Case No. 16 had long been in bad health, and had, in my opinion, been suffering from either piles or vomiting of blood. She was attacked with vomiting, and was purged four or five times, and being in a weak state of health, rapidly became collapsed and died. I would scarcely feel inclined to put this down as a death from cholera, as her low state of health was such as would at any time have rapidly succumbed to an acute attack of diarrhœa.

The Hospital Assistant at Kollam has heartily entered into his duty, and I must state that to his energetic carrying out of the orders sent him from the Sub-Collector's Office here is mainly due the arrest of the disease at Kollam, as up to this date no fresh cases have been reported. Great benefit has been obtained by at once sending Hospital Assistants to the infected districts, as their presence has given confidence to the people, and tended greatly to allay their fear.

From the Sanitary Commissioner for Madras, to the Collector and Magistrate of Malabar, dated 25*th November* 1870, *No.* 1,112.

In reply to your letter, No. 3,157-E., of 19th current, I have the honour to state that the facts before me, in regard to the late outbreak of cholera in Quilandy, are too scanty to allow me to offer an opinion as to the influence of a sardine diet in producing the disease. The fresh fish is ordinarily, I believe, quite wholesome; but, if it were eaten in a condition of semi-putridity, I have no doubt it would cause considerable derangement of the bowels, and predispose to cholera, or a choleraic form of diarrhœa. I have addressed the Civil Surgeon of Tellicherry on the subject of the cholera outbreak, and, when I get his reply, I shall be in a position to dispose more fully of your reference.

It was the opinion of Dr. Pearse, for some years Civil Surgeon of Calicut, that there was some connexion between the mortality of fish along the coast and the ordinary coast cholera. The cause of the sudden mortality of fish and stench of the sea on the Western Coast is not very clearly made out. It has been supposed to depend on the bulk of fresh water discharged into the sea; but, against this theory, there is the fact that the death of the fish does not always occur at the time when the rivers are in highest flood. I am not aware if there has been any fish mortality this season, or, if so, at what time it showed itself. It would be well to ascertain the facts, and I have asked the question of the Civil Surgeon.

But in connexion with this sudden development of cholera at Quilandy, it must be noted that the Travancore country, and more lately, places in Native Cochin, have been visited by true epidemic cholera for some months past. The cholera in Travancore was undoubtedly the continuation of the disease as it affected Madura and Tinnevelly. It would not cross the mountain barrier between Tinnevelly and Travancore, but having passed from north to south to Cape Comorin, it travelled round the rocky barrier, and then progressed up the coast from south to north. I think it not at all unlikely the cholera now in your district is a direct continuation of the cholera which was lately common at Quilon, Alleppy, and Kotyam; but until I get the facts before me, it is not very easy to see their relative importance.

Should this cholera be a continuation of the epidemic, it is quite possible that the district will suffer generally; and my reason for giving this opinion is that the disease has been absent in epidemic form since 1865, and consequently a large number of persons must now be ready to receive and develop the specific poison in their bodies, whenever the epidemic finds its way into the district.

If, however, the cholera should be connected with the use of putrid fish, it will probably be a local disease confined mainly to villages on the coast line.

From A. MACGREGOR, Esq., Magistrate of Malabar, to the Acting Secretary to the Board of Revenue, dated Calicut, 21st December 1870, No. 403.

In continuation of my letter of the 2nd instant, No. 398, I have the honour to enclose copy of a communication received from the Sub-Collector on the subject of the prevalence of cholera in his division.

It will be observed that a second outbreak has occurred, more serious than the first, but that it has been by energetic measures got under.

I have received reports of an outbreak in the vicinity of Chowghaut, in the south of the district, and have despatched my Dresser to co-operate with the Dresser attached to Ponany in affording the necessary medical aid and assistance to the Deputy Collector.

From W. LOGAN, Esq., Joint Magistrate, to the Magistrate of Malabar, dated Tellicherry, 15th December 1870, No. 1,152.

In continuation of my letter No. 1,104, dated 28th ultimo, I have the honour to inform you that Dr. McAllum and I paid another visit last week to the cholera infected localities in Kurumbranad Talook.

The disease has taken firm hold of the portion of the Maniyur Amshom, lying immediately opposite to Payally bazaar, on the north side of the Kota river. I enclose a list of the cases classified according to houses, and will forward to you a nominal roll, with full particulars.

We visited several of the houses where the disease had proved most fatal and instituted enquiries as to the origin of it. The first person attacked was a Moplah woman, whose husband assured me that she had not left the precincts of his house at all for many months previously to the date she was attacked. No possible clue could be obtained as to the origin of the disease in her case, until I asked the man what she had been eating the night before she was attacked, when he replied, that she had eaten freely of the sardine fish (Mathi meen). The next house attacked was that belonging to the people of the Tiyar caste. It was said that one of them had gone to the Moplah's house for betel nut, and, seeing the Moplah woman's dead body, had taken fright and been attacked.

This statement, however, was not very clearly made out; the family had been eating the sardine fish too. Two days elapsed before the occurrence of the third case in the house of a Polayam out-caste. The surviving head of the family could give no clear explanation as to the origin of the disease. They had been living as usual, and had been eating the sardine fish too before the disease broke out. The first attacked in his house was a child of six years. On the following day, no less than eight fresh cases occurred in these three houses, one more next day, and two more on the third day. The three houses are all within half a mile of each other, and are in secluded places, far from any roads or much frequented foot paths. The occurrence of the disease in these three houses belonging to people of different castes points, I think, to the disease having a common origin. It is scarcely probable that a child of six years would be affected by fear; it could not have visited either the Moplahs or Tiyar's houses, and I am disposed to believe that the eating of the oily sardine fish was provocative of the disease in the third house as in the first one. The eating of this fish has been mentioned as the cause of the disease in many of the sporadic cases. The fish itself may not be poisonous, but it is certain that its exceeding plentifulness in certain years makes it very cheap, and that in these years it contains a large amount of fatty matter. Poor people are, therefore, enabled to bny it and to eat it freely, and the result in very many cases is indigestion followed by vomiting and purging. It is noteworthy if true (as I have been assured it is) that the last time this oily sardine fish was common on the Coast was in 1864-65 and 1865-66 when upwards of 40,000 deaths from cholera were reported in the district.*

I regret to inform you that I have been obliged to suspend the Adigari of Maniyur Amshom for negligence in reporting the outbreak. No less than five deaths had occurred before he discovered that the disease had broken out at all. The Dresser stationed at Payally heard of one case by accident, and, on going over the river, discovered that eleven or twelve cases had occurred, and it was not till then that the Adigari reported the matter. The disease had taken such firm hold of the place before it was reported that it has been difficult to get rid of it. I regret also to inform you that after the discovery of the outbreak, the local officers failed to take the requisite steps for putting the place in a proper state of sanitation. I have been obliged to administer a severe rebuke to the Tahsildar, who (though by my orders he visited the locality) seemed to have done nothing

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* The facts are correct as regards the cholera deaths, but the greatest cholera mortality occurred in June and July 1865, a season when no sardine fish are caught. The shoals of sardines visit the coast *after* the south-west monsoon is ended, *i.e.*, in September, October and November.—(W. R. C.)

towards making the people carry out the instructions issued. He had to be reminded of his duty to visit infected houses and to set a good example to the Adigaris.

The Dresser at the spot, Ramaswami Naidoo, is an Eastern Coast man, unacquainted with the people of the district. The people don't understand him, and he very foolishly, though perhaps naturally enough, supposes that every Moplah with a pisankhutti in his waist would kill him if he only had a chance. He has not been so useful as your Dresser was at Quilandy.

The disease has nowhere else become local; sporadic cases have occurred in many amshoms.

The three other Dressers are stationed at present—one at Mowral at bridge, on the coast road, examining travellers and treating cases in that neighbourhood; one at Badagerra; and the third at Kiyur, near Payally, where the cattle fair is being held. In fact, they, as it were, form a circle round Maniyur ready to go to any place where the disease shows a tendency to become local. I am thoroughly persuaded the disease can be stamped out in a place in a short time by vigorous action on the part of the Sub-Magistrates and Adigaris; the mere visiting of the infected houses gives the people courage.

When at Payally Dr. McAllum and myself visited Kiyur, and drew up certain rules for the guidance of the Quilandy Sub-Magistrate, whom I have ordered to remain at that place till the cattle fair is over. Notices have been posted at all the bridges and ferries in my division and other places warning people who intend going to the fair that cholera prevails in the neighbourhood.

The disease has disappeared from Kollam where it first broke out, as reported in my last letter, and this, I think, is in no small degree due to the sanitary measures taken.

CHOLERA IN THE GODAVERY AND KISTNA DISTRICTS.

Importance of human intercourse in the distribution of cholera not sufficiently estimated in present day.

85. It seems to be the fashion now-a-day, in treating of the mode of progression of cholera, to attach a primary importance to the moist air of monsoon winds as a carrier of the germs of the disease, and to under-estimate the importance of human intercourse in its diffusion. Such at least appear to be the guiding principles of the sanitary advisers of the Government of India, and, as these views do not seem to me to be warranted by the facts coming under my own observation, I feel bound to request that the circumstances to be narrated in connexion with the appearance of cholera in the Northern Districts of this Presidency may be carefully weighed, as they do not seem to me to be explicable on any aerial theory of invasion.

Physical features of the Godavery and Kistna Districts.

86. The Godavery and Kistna Districts of the Madras Presidency occupy a tract on the sea-board of the Coramandel Coast from 15·45° to 17·45° N. L. These districts, from thirty to forty miles inland, are composed of flat, sandy, alluvial plains, and the whole seaboard is irrigated by canals taken off from the "anicuts" at Dowlaishweram on the Godavery, and Bezwada or the Kistna rivers. The western portion of the districts is hilly and jungly, and include the Golcondah chain of hills, which constitute the so called Eastern "Ghauts," and these hills divide the districts from the table-lands of the Deccan and Jeypoor.

Cholera history in 1859 and 1865.

87. The cholera history of this tract in the invasion of 1859 shows that the wave of cholera overflowing the Deccan in that year, overstepped the Eastern Ghauts, and extended down to the seaboard, affecting the Godavery and Kistna Districts. In the next year of invasion, 1865, the same thing happened. Cholera prevailed in all of the stations of both districts, of which records have been kept, except Masulipatam on the coast.

Exemption of the districts in the invasion of 1868-69.

In the cholera invasion of 1868, which reached Hyderabad in November 1868, during the north-east monsoon winds, it is an undoubted fact that cholera was not pushed on in an easterly direction, so as to overlap the Godavery and Kistna Districts. Theorists

may give any explanation they please of the fact, but, in a narrative of events, I have only to put down the facts to the best of my ability. In my introductory remarks, and in the cholera report for 1869, I have shown that the cholera advance from Hyderabad was in a southerly direction, and that the districts to the eastward escaped absolutely. I say absolutely, because although three deaths were entered as cholera in the Kistna District in 1869, these two densely populated districts had no epidemic, nor hardly a single case of cholera in them from the end of March 1868 to the end of March 1870. In the Godavery District, in fact, not a single death during this period was put down to cholera, and the few deaths that did occur were confined to the Kistna District. In districts which have been so completely exempted, it is of the greatest importance, therefore, that the earlier cases of a new invasion should be accurately recorded. Fortunately, as regards the Godavery District, the facts of the outbreak have been most carefully ascertained.

Details of the mode of introduction of cholera into the Godavery District.

88. The first cholera death occurred on the 28th March in a small out-of-the-way village, on the right bank of the Godavery, in the Talook of Ernagudium. The village, Woongatla, is not mentioned in the ordnance map, but is situated two miles south-west of Chagalla. The village is not upon any high road, nor is it frequented by strangers. The only fact recorded, in regard to its sanitary condition at the time of out-break, is that an offensive cesspool connected with a distillery existed there.

Cholera Deaths in the Northern Districts, 1870.

—	Godavery.	Kistna.	Vizagapatam.
Population.	1,427,472	1,296,652	1,505,045
January	...	...	...
February	...	...	9
March	...	12	5
April	72	6	11
May	365	...	...
June	3,011	70	10
July	5,231	566	72
August	3,504	1,110	78
September	668	209	51
October	235	62	...
November	186	8	21
December	33	...	2
Total ...	13,305	2,043	259

The Godavery District a new centre of cholera diffusion.

89. This table distinctly proves that the Godavery District was a centre, for the time being, of epidemic cholera, and that the districts to the north and south of it were secondarily affected. (The eighteen deaths in the Kistna District in March and April occurred in one of the upland talooks a long distance away from the Godavery centre, and may be left out of account in tracing the epidemic distribution.) The epidemic became very prevalent in the Godavery District in the month of June, though it did not prevail in the Kistna District to any extent until July. Accordingly, to the theory that the south-west monsoon winds carry the disease, the Vizagapatam District should have suffered more than the Kistna District to the south; but, as a matter of fact, owing to the geographical position of the districts, the south-west monsoon winds could not have carried cholera from the Godavery into

Actual facts opposed to theories of monsoon winds carrying cholera.

the Kistna, and yet the latter district had ten times as much cholera as the Vizagapatam District to the north, over which the monsoon winds from the Godavery tract would naturally flow. The affection of the Godavery District appears indeed to be wholly inexplicable on any theory of aerial transmission of the poison. At the very time cholera was extending in this district both to the north and south, it was travelling on through Tinnevelly to the south, against the current of wind, towards Ceylon, and having got to the extreme south of the Peninsula, cholera not only passed over to Ceylon, but also turned round by Cape Comorin and pursued a northerly direction along the strip of country containing the Native States of Travancore and Cochin, but up to the end of the year it had not extended in force so far north as Cannanore. So far as we can judge, cholera was not beaten back by the south-west, nor was it hurried onward by the north-east, monsoons. From the time of the irruption of the epidemic wave in Lower Bengal in February and March 1868, it took exactly two years to reach the southernmost district of Madras territory (Tinnevelly), and in this southern progress it was neither advanced nor retarded by monsoon winds, though undoubtedly monsoon moisture favoured its spread in the localities invaded.

Investigation of facts by the Sub-Collector & Police Superintendent of the District.

For the main facts of the beginning of the Godavery outbreak I am indebted to two gentlemen who pursued their inquiries independently of each other—the Sub-Collector of the District, and the Superintendent of Police. Their reports differ in minor particulars only, and are perhaps the more valuable because of those minor differences.

First case of cholera at Woongatla in Ernagudium Talook on 28th March.

90. The history of the first fatal case then is briefly this :—A man was seized with cholera in the village of Woongatla on the 28th March while at field labour, and died in twelve hours. On the same date, according to the Sub-Collector, two children in the village were seized, both of whom recovered. (The Superintendent of Police, whose investigations were confined to fatal cases, does not allude to this circumstance.)

Neither the man who died, nor the children who recovered, had left the village, " nor had any strangers passed through." On these points both investigators are agreed.

Return of pilgrims from a cholera-stricken locality four days previous to outbreak.

91. But on the 24th March, four days prior to the outbreak of cholera, an unusual circumstance in the monotonous routine of Indian village life had happened in Woongatla. Two families belonging to the village had made a pilgrimage to the celebrated shrine of Tripatti in the North Arcot District. The exact date of their departure from Woongatla is not recorded, but it is certain that they returned to their homes on the 24th March 1870. They must have been exposed to choleraic influences both at the pilgrim's shrine and on the route home, a long and tedious land journey, viâ Nellore and Ellore. They passed through the town of Nellore on the 9th March at a time when cholera was rife in the town. On arrival at Ellore on the 20th March two children (according to the Sub-Collector, and one according to the Superintendent of Police) were seized with cholera, or " choleraic symptoms." The children, or child, recovered before the pilgrims reached Woongatla.

Cholera amongst the pilgrims' families before reaching home.

Here then is the fact that persons exposed to cholera influences in their homeward journey reach their village, and four days afterwards cholera is produced in that identical village, and in none else. The advocates of the aerial

theory of transmission must surely have some little difficulty in explaining why this village should have been affected in preference to the remaining 3,388 villages in the district. But assuming that the *fomes* of cholera may be carried about in the clothing of travellers, how easy is it to fill up the blanks in the picture!

92. Here we have two families making a long land journey; during the latter part of which they pass through cholera infested districts, and one or more of the party become affected with the disease. Those who know how the natives of India travel, can easily picture to themselves the bundles of dirty clothes accumulating on the way, and the small probability of any of the clothing being washed before they got to their destination. The news of the arrival of two families from a famous place of pilgrimage would very soon spread in a small village, and it is easy to imagine that their old friends and acquaintances would lose no time in waiting upon them to hear an account of what had befallen them on their travels. The dirty clothes and accumulated filth of the journey would also probably, for the first time, be disturbed on arrival at their village home. In this way, it may be surmised, the villagers of an unaffected locality were brought into contact with the *materies morbi;* and the new field for development being favourable, cholera began at once to burst into activity.

Proneness of districts which have had a long exemption to suffer from cholera.

93. In dealing with this part of the subject we must bear in mind that a locality which has enjoyed exemption from cholera for a lengthened time, is always in a more favourable condition to feel the choleraic influence, than a district that has lately been swept by an epidemic. If cholera had recently prevailed in the village, it is probable that an importation of the germs might have borne no fruit. There can be no doubt, I think, that cholera will always prefer an unoccupied locality, when it has the chance, and there can be no doubt that the whole of the Godavery and Kistna Districts were, by the simple reason of their unusually prolonged exemption, ready for occupation in the spring of 1870.

Interval between the first cases and the outbreak.

94. After the three cases at Woongatla on the 28th March, there were no fresh attacks in the village until the 12th April, when it broke out with considerable virulence.

The following return shows the daily mortality in the village :—

1870.	March 28	April 12	„ 13	„ 14	„ 15	„ 16	„ 17	„ 18	„ 19	„ 20	„ 21	„ 22	„ 23	„ 24	„ 25	„ 27	„ 29	May 4	„ 6	„ 10	„ 13	„ 17	„ 28	„ 30
Woongatla cholera deaths ... ... Population.—1,138	1	3	4	5	3	3	2	3	5	3	6	1	2	8	1	2	1	2	1	2	2	1	2	3

Outbreak confined to the one village until 19th April.

From the 28th March to the 9th April, the outbreak was confined to the village of Woongatla. It next appeared in a small hamlet Gudiwada and then in a village Bramanagugen, about a mile off, and subsequently spread to the adjacent villages of Markondapad and Nandigampada.

This distribution will be better seen in the daily register of cholera deaths for the month of April.

Villages.	Gudiwada.	Chagalla.	Pangidigudem.	Vadapalli.	Woongatla.	Ellore Municipal Town.	Malakapuram.	Bramhanagudem.	Pemmaraz Polavaram.	Vadangi.	Total.
Population	697	2,106	443	1718	1,138	19,910	667	910	375	1,044	29,008
April 1	...	...	...	...	...	...	...	...	...	...	...
" 2	...	...	...	...	...	...	...	...	...	...	...
" 3	...	...	...	...	...	...	...	...	...	...	...
" 4	...	...	...	...	...	...	...	...	...	...	...
" 5	...	...	...	...	...	...	...	...	...	...	...
" 6	...	...	...	...	...	...	...	...	...	...	...
" 7	...	...	...	...	...	...	...	...	...	...	...
" 8	...	...	...	...	...	...	...	...	...	...	...
" 9	1	...	...	...	...	...	...	...	...	...	1
" 10	...	...	...	...	...	...	...	...	...	...	...
" 11	...	...	...	...	...	...	...	...	...	...	...
" 12	...	...	...	...	3	...	...	...	...	...	3
" 13	...	...	1	...	4	...	...	...	...	...	5
" 14	...	...	...	...	5	...	...	...	...	...	5
" 15	...	...	...	...	3	...	...	2	...	...	5
" 16	...	1	...	1	3	...	...	...	...	...	5
" 17	...	...	...	...	2	...	...	...	...	...	2
" 18	...	...	...	...	3	...	...	...	...	...	3
" 19	...	...	...	...	5	...	...	...	...	...	5
" 20	...	...	...	...	3	...	...	2	1	1	7
" 21	...	...	...	...	6	...	...	...	...	...	6
" 22	...	...	...	...	1	...	...	...	...	...	1
" 23	...	...	...	...	2	...	...	...	...	...	2
" 24	...	...	...	...	5	...	...	1	...	...	6
" 25	...	...	...	...	1	...	...	1	1	...	3
" 26	...	...	...	...	...	...	1	...	...	...	1
" 27	...	...	...	...	2	...	1	...	...	...	3
" 28	...	...	...	...	...	...	...	...	...	...	...
" 29	...	...	...	...	1	1	...	2	...	...	4
" 30	...	...	...	...	...	...	1	4	...	...	5

Extension of epidemic to Rajahmundry.

95. The extension of the epidemic to Rajahmundry is thus described by the Sub-Collector :—

" On the 3rd May, the Hospital Assistant attached to my office was sent to Woongatla to attend to the people attacked there; he was seized himself with the disease on the 8th of the same month, and was brought on a litter to Rajahmundry in a comatose and dying state. That same night cholera broke out in the district jail and also in the town. It gradually extended to Juggiampet and other villages of the Peddapur Talook, and is now (22nd July 1870) prevalent more or less throughout the whole district."

Outbreak in Jail three days after arrival of infected persons in the town.

The statement as to the exact date of the outbreak in the Jail and town is not quite correct. From a report received from the Civil Surgeon of the station, it seems that both the Hospital Assistant and his servant were brought into the town on the 8th of May dying of cholera, and that the prisoners were not attacked until the evening of the 11th May. The following is the true account :—

" The outbreak, although not quite unexpected, was sudden. The prisoners to all appearance being in their usual good health when they were locked up on the night of 11th May 1870. At eight o'clock on that night, a prisoner was brought to hospital labouring under symptoms of the disease. The second and third cases occurred at 2 A.M. the following morning * * * Six more men were attacked the same day. Six others were attacked on the 13th. The

epidemic lasted but three days, viz., from the night of the 11th until the evening of the 14th; during which time there were four deaths out of sixteen seizures."

Outbreak in the town of Rajahmundry.

96. The first death occurred in the town on the 12th May, and from that time to the end of the month there were forty-six deaths. I may note here that the Central Jail built on an open airy site, outside the town of Rajahmundry, though averaging 845 inmates, never had a single case of cholera. As to the climatology of Rajahmundry, the Civil Surgeon remarks, "I noticed nothing extraordinary in the state of the weather, which is always hot and dry at this time of the year." The town was quite healthy before the arrival of two cholera-stricken patients on the 8th May. The Civil Surgeon informs me that he cannot trace any actual communication between the prisoners, or officers of the jail, and the two men who died of cholera in the town on the 8th May.

Condition of pilgrim's site at Budrachellum, Upper Godavery District.

97. The sudden and virulent outbreak of cholera in the Godavery District led me to inquire whether the pilgrims frequenting the shrine of Budrachellum on the Upper Godavery had anything to do with it. The festival of this place began on the 10th April and lasted till the 12th, and the Superintendent of Police notes that some pilgrims returning from the festival reported its appearance there on the 10th April. The Sub-Collector also states, "it is reported that the disease prevailed there to a slight extent of a mild type."

Report of Assistant Surgeon Hazlett.

This testimony, however, is but of little value, as Budrachellum is not within the official supervision of either reporter, and they must have been obliged to trust to current rumours. Against these rumours, there is the positive testimony of a competent professional observer, who was present at the festival, and who declares that no cholera prevailed there. The following letter from Assistant Surgeon Hazlett is, I think, conclusive on the point of the absence of cholera to the eastward of Woongatla during the early days of April:—

"In reply to your letter, No. 970, of the 24th ultimo, I have the honour to inform you that I was present at Budrachellum, during the festival held there in last April. No cases of cholera or severe diarrhœa were brought to my notice, and I do not think that any could have occurred without my knowledge, as in addition to a Dresser, there were a number of police stationed there, who had instructions to report any cases of sickness.

"I received information about the same time that there had been a mild outbreak at Rajahmundry.* I think it occurred in the end of the previous month, but I have no reason to suspect that it spread into this district, for even if it had prevailed in any of the small detached villages in the jungle, I would probably have heard of it through the police, and if amongst any of the gangs of coolies, it would certainly have been reported to me. From my own experience and from the history of former epidemics, I am of opinion that cholera has always been imported from the Lower Godavery District, where it usually is very prevalent, and it has been brought from thence into this district by people either coming for employment on the works or to attend the festival at Budrachellum. The latter place and Doomagudiem are the only villages of any importance in this vicinity, and cholera always commences in one or the other, usually in Budrachellum, on account of its being the first place of any size arrived at by people coming up from the lower district. Since this has been an Engineering station, there have been three epidemics in 1865-66 and 1870; all originated at Budrachellum, the first during the festival, the two latter about the commencement of the rains; but, according to reports, cholera has on former occasions frequently visited this neighbourhood."

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* This must have been a mistaken rumour. There was no cholera in Rajahmundry before 8th May.—(W. R. C.)

Cholera did not reach Budrachellum until the 20th of June, and there cannot be the least doubt that it was secondarily affected from the cholera centre established in the Lower Godavery District.

The outbreak in Godavery District due to importation alone.

98. I have been at some pains to show that this outbreak of cholera in the Godavery District was due to importation alone, and I may here mention that the Nizam's country, and the Central Provinces to the eastward had no cholera during 1870, nor was there any epidemic in the District to the northward (Vizagapatam) when the disease broke out in the Godavery District. There is, moreover, the direct proof, that persons who had recently passed through tracts of country infected by cholera, and some of whom had recently suffered from a disease believed to be cholera, came back to their homes in a village, where the disease beyond doubt first showed itself, and "thence radiated in various directions" as the Superintendent of Police has properly described the subsequent progress.

99. Dr. Bryden maintains that, although cholera may thus be introduced into a locality, it has no vital power, and that cholera so introduced does not become a focus for the further spread of the disease. In this respect also the facts in regard to the late outbreak in the Godavery District yield no support to such a theory. The facts show, that from the very small beginnings in the village of Woongatla, there proceeded a very terrible epidemic, extending not only over that one district of the Godavery, but spreading slightly to the north in the Vizagapatam District, and more severely to the south in the Kistna District.

Gradual extension of the epidemic from the infected centre.

In the table below we see that in the month of April cholera was almost entirely confined to the Ernagudium talook and Tanaku talook to the east; in these talooks it attained its maximum intensity in June and July, whereas in Peddapore and Zemindaries to the north, and the Ellore talook to the south, the maximum of intensity was not reached until one or two months later, or in August and September. The table shows, in fact, that the intensity of the epidemic spread as from a centre, and that the centre was occupied by the Ernagudium and Tanaku Talooks, where it is conclusively shown that the disease commenced to spread epidemically.

Table showing particulars of Cholera Deaths in the different Talooks and Municipal Towns of the Godavery District during each month of 1870.

—	Rajahmundry Municipal Town, North of Talook.		Rajahmundry Talook, North West of District.			Coconada Municipal Town, East of Talook.		Peddapore Talook, North of District.			Ramachendrapore Talook, East of District.			Amalapore Talook, S. E. of District.			Narsapore Talook, S. of District.		
Population...	17,498		83,426			16,167		101,539			184,110			189,233			161,537		
Total No. of Villages in each Circle ...	—		600			—		238			223			317			205		
Months.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.
January		...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
February...		...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
March		...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
April		...	...	...	...		...	1	697	1	...	...	...	...	...	...	2	1,419	3
May		46	2	1,343	2		...	...	...	...	2	3,342	4	4	5,052	7	15	20,266	76
June		59	26	27,299	116		2	34	45,960	298	33	42,315	183	51	86,482	413	44	75,042	214
July	17,498	18	25	20,664	208	16,167	12	53	62,268	338	95	130,148	968	109	141,752	813	89	130,840	823
August		4	26	31,479	271		33	33	40,108	342	71	107,777	808	55	86,747	222	54	82,027	280
September		12	14	20,213	71		18	14	20,378	84	41	60,815	165	19	34,395	102	13	22,994	48
October		4	4	11,991	39		3	1	658	1	23	36,099	52	28	43,648	87	3	3,939	12
November		4	3	8,088	6		22	5	9,114	7	18	31,329	49	21	25,686	69	...	...	...
December		7	...	...	...		...	...	...	...	1	637	9	1	2,009	10	...	...	...
Total...	—	154	—	—	713	—	9	—	—	1071	—	—	2238	—	—	1723	—	—	1456

Table showing particulars of Cholera Deaths in the different Talooks and Municipal Towns of the Godavery District during each month of the year 1870.—(Continued.)

—	Undi Talook, South of District.			Tanaku Talook, South of District.			Ellore Municipal Town, S. W. of Talook.		Ellore Talook, S. W. of District.			Ernagudium Talook, W. of District.			Zemindaries.		
Population	83,826			152,052			19,940		98,795			130,383			53,605		
Total No. of Villages in each Circle ...	163			227			—		391			617			408		
Months.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.
January	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
February	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
March	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
April	..	...	...	1	910	12		1	1	667	3	4	5,405	52	...	...	...
May	4	6,734	11	23	28,542	85		65	9	8,632	33	6	6,098	33	2	3,023	...
June	32	31,419	159	90	87,201	1,011		30	26	22,994	129	28	30,799	280	26	51,153	117
July	50	49,950	458	99	109,668	1,017	19,940	45	24	24,384	103	32	36,101	149	44	75,767	279
August	31	34,905	233	48	50,378	356		46	22	21,408	164	19	25,162	122	61	88,692	623
September	8	6,973	37	6	8,647	16		2	8	8,327	19	2	1,738	14	27	30,200	80
October	1	753	1	2	5,170	8		4	1	74	4	2	2,407	10	4	3,714	10
November	...	...	...	2	6,102	17		...	3	5,580	9	...	...	...	2	9,703	3
December	...	...	...	2	6,705	...		7	...	...	...	...	...	...	...	...	...
Total...	—	——	899		——	2,522	——	200	—	——	464	—	——	660	—	——	1,114

The total number of deaths in the Godavery District, the direct effect, so far as can be made out, of the original importation into Woongatla village in the month of March, was 13,305 and the relative mortality to population in each registration circle is as below:—

Table showing proportion of Deaths to 1,000 *of Population of the different Talooks and Municipal Towns of the Godavery District during each month of the year* 1870.

Talooks and Municipal Towns.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Rajahmundry Municipal Town ...	...	...	...	...	2·6	3·3	1·02	0·2	0·6	0·2	0·2	...	8·4
Do. Talook	...	...	...	...	0·02	1·3	2·49	3·2	0·8	0·4	0·07	...	8·5
Coconada Municipal Town ...	...	...	...	...	...	0·1	0·7	2·04	1·1	0·1	1·3	0·4	5·9
Peddapore Talook ...	...	...	...	0·009	...	2·9	3·3	3·3	0·8	0·009	0·06	...	10·5
Ramachendrapore „ ...	...	...	...	...	0·02	0·9	5·2	4·3	0·8	0·2	0·2	0·04	12·1
Amalapore „	...	...	...	...	0·03	2·1	4·2	1·1	0·5	0·4	0·3	0·05	9·1
Narasapore „	...	...	...	0·01	0·4	1·3	5·09	1·7	0·2	0·07	...	...	9·01
Undi Talook	...	...	...	...	0·13	1·8	5·3	2·7	0·4	0·01	...	...	10·7
Tannaku „	...	...	...	0·07	0·5	6·6	6·6	2·3	0·1	0·05	0·1	0·04	16·6
Ellore Municipal Town	...	...	...	0·05	3·2	1·5	2·2	2·3	0·1	0·2	...	...	9·6
Ellore Talook	...	...	...	0·03	0·3	1·3	1·04	1·6	0·1	0·04	0·09	...	4·6
Ernagudiem Talook	...	...	...	0·3	0·2	2·1	1·1	0·9	0·1	0·07	...	...	5·06
Zemindaries	...	...	...	...	0·03	2·1	5·2	11·6	1·4	0·1	0·05	...	20·7

Intensity of cholera influenced by moisture of soil.

100. It will be observed from the large cholera map that the intensity was greatest in the talooks of the delta of the Godavery river, on either side of the river, after its division into channels and canals. The conditions of soil and sub-soil moisture, in fact, in this river delta, are almost identical with those I have noticed in reference to the Cauvery delta in Tanjore. There are, however, these important distinctions in the sanitary history of the two deltas, namely, that cholera is often completely absent from the Godavery delta for long periods together, while in Tanjore it is nearly always present, and that the Godavery District is especially liable to a heavy fever mortality after the setting in of the north-east monsoon, while in Tanjore the mortality from this cause is always low, and is less influenced apparently by monsoon rains. The Godavery delta, moreover, usually feels the cholera influence most severely during the season of the south-west monsoon, and that of the Cauvery during the north-east monsoon. The former district is liable to rainfall from both monsoons, but Tanjore receives its greatest rainfall during the north-east monsoon. Both districts are brought under irrigation, when the Cauvery and Godavery rivers are filled by the south-west monsoon rains.

101. Kistna District.—There is little to be said in regard to cholera in the Kistna District, except that it was manifestly the direct southern extension of the outbreak in the Godavery District. It did not appear before June in epidemic form. The eighteen deaths in the Palnad Talook in March and April were, so far as I can judge, independent of the outbreak later on, for the talook was wholly free of cholera after April. The Nundigama talook adjoining the Nizam's country had not a single case, nor had the talooks of Sattanpully and Vinnaconda. In no part of the affected talooks was there any general prevalence previous to the month of August. Many talooks of this district are under canal irrigation during the south-west monsoon season, but they suffered much less from cholera than the irrigated tracts of the Godavery District.

The following table will give all particulars in regard to the talooks and number of villages affected.

The total of Cholera deaths in the whole district was only 2,054 and the ratio of deaths to population in the several registration circles is given in the second table.

Table showing particulars of Cholera Deaths in each Talook and Municipal Town of the Kistna District during each month of the year 1870.

Kistna.	Nundigama Talook, North of District.			Bezwada Talook, North of District.			Gudivada Talook, North-East of District.			Masulipatam Municipal Town, East of Talook.		Masulipatam Talook, East of District.			Repalli Talook, South-East of District.			Bapetla Talook, South of District.		
Population ...	98,637			73,373			80,171			27,902		118,620			155,092			129,528		
Total No. of Villages in each Circle	253			225			307			—		418			494			286		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January ...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
February ...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
March ...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
April ...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
May ...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
June ...	..	...	...	3	7,008	4	6	4,714	38		4	...	...	...	...	...	...	...	...	...
July ...	...	...	...	10	7,526	142	28	17,259	95	27,902	17	11	8,079	29	4	5,736	15	...	...	...
August ...	...	...	...	21	22,053	215	27	17,614	211		21	13	13,207	207	4	4,548	35	...	...	...
September ...	...	...	...	6	10,173	31	14	12,832	57		18	15	15,249	49	1	494	5	...	...	...
October ...	...	...	...	1	606	2	5	3,879	13		4	7	10,621	13	2	1,058	6	3	11,330	6
November ...	...	...	...	2	1,256	2	...	...	...		...	2	929	2	...	...	...	3	2,497	4
December ...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
Total...	—	—	—	—	—	396	—	—	414	—	64	—	—	300	—	—	61	—	—	10

Table showing particulars of Cholera Deaths in each Talook and Municipal Town of the Kistna District during each month of the year 1870.—(Continued.)

Kistna District.	Rajapett Talook, South of District.			Vennacondah Talook, South of District.			Palnad Talook, South-West of District.			Krosur Talook, West of District.			Guntoor Municipal Town, Centre of Talook.		Guntoor Talook, Centre of District.			Zemindaries.		
Population	102,136			52,574			106,395			84,000			15,184		98,779			105,438		
Total No. of Villages in each Circle ...	253			190			180			234			—		183			367		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...
February	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...
March	...	...	...	...	...	...	2	3,610	12	...	...	...		...	...	...	...	...	...	...
April	...	...	...	...	...	...	1	...	6	...	...	...		...	...	...	...	...	...	...
May	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...
June	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	8	6,681	24
July	...	...	...	...	...	...	...	...	...	...	...	...	15,184	...	...	...	...	22	16,061	268
August	...	...	...	...	...	...	...	...	...	...	...	...		...	4	4,080	42	39	31,196	398
September	2	2,050	8	...	...	...	...	...	...	...	...	...		...	1	981	2	...	...	31
October	7	8,639	14	...	...	...	...	...	...	...	...	...		...	...	...	...	3	4,216	4
November	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...
December	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...
Total...	—	—	22	—	—	—		—	18	—	—	—	—	—	—	—	44	—	—	725

Reproduction in Kistna District may be looked for during 1871.

102. From the fact of the Kistna District but partially suffering during the year of invasion, a reproduction of cholera may be anticipated during the current year, should climatic and other causesbe favourable to the renewal.

Table showing proportion of Deaths to 1000 *of Population of the different Talooks and Municipal Towns of the Kistna District during each month of the year* 1870.

Talooks and Municipal Towns.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Nundigama Talook	...	...	...	...	...	...	...	...	...	...	...	...	...
Bezwada „	...	...	...	...	...	0·05	1·9	2·9	0·4	0·02	0·02	...	5·39
Gudivada „	...	...	...	...	...	0·4	1·1	2·6	0·7	0·1	...	...	5·16
Masulipatam Municipal Town .	...	...	...	...	...	0·1	0·6	0·7	0·6	0·1	...	...	2·29
„ Talook	...	...	...	...	...	...	0·2	1·7	0·4	0·1	0·01	...	2·52
Repalli „	...	...	...	...	...	...	0·09	0·2	0·03	0·03	...	...	0·39
Bapetla „	...	...	...	...	...	...	...	...	...	0·04	0·03	...	0·07
Rajapett „	...	...	...	...	...	...	...	...	0·07	0·1	...	...	0·21
Vinnacondah „	...	...	...	...	...	...	...	...	...	...	...	...	...
Palnad „	...	...	0·1	0·05	...	...	...	...	...	...	...	...	0·17
Krosur „	...	...	...	...	...	...	...	...	...	...	...	...	...
Guntoor Municipal Town ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Guntoor Talook	...	...	...	...	...	...	...	0·4	0·02	...	...	...	0·44
Zemindaries	...	...	...	...	...	0·2	2·84	3·77	0·2	0·03	...	...	6·87

103. Vizagapatam District.—What has been said of the Kistna District applies also to the Vizagapatam District to the northward. It felt the influence of the cholera explosion in the Godavery District to a slight extent only, and at a later date.

Setting aside the few deaths in the early months of the year from the ordinary spring cholera of the coast, it is evident that the movement of cholera from the local centre of the Godavery only reached the district in July. The portions of the district mainly affected were the talooks of Vizianagrum and Bimlipatam, which being on the high road to the northern port of Bimlipatam, were naturally brought more into communication with the affected centre of the Godavery District, than any other talooks. The total of cases was insignificant, and the following table shows their distribution :—

Table showing particulars of Cholera Deaths in the different Talooks and Municipal Towns of the Vizagapatam District during each month of the year 1870.

Vizagapatam District.	Palcondah Municipal Town, North of Talook.		Palcondah Talook, North of District.			Survasidy Talook, South-East of District.			Golcondah Talook, South-West of District.			Parvatipore.			Bobbilli.			Salur.			Chipparapally.			Gajapatinagrum.		
Population	8,410		130,169			100,030			78,195			118,900			112,367			61,179			162,112			84,306		
Total number of Villages in each Circle	—		509			296			591			*			144			2			18			*		
Months.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
February		...	1	736	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	817	2	1	899	1
March		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1,820	2	...	...	...
April		...	...	...	...	1	737	1	...	...	...	2	2,968	4	...	...	...	...	...	...	1	521	1	...	...	...
May		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
June		...	...	...	...	3	7,076	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
July	8,410	...	...	...	...	...	...	...	2	3,777	2	1	413	1	1	1,055	1	...	...	...	2	2,081	2	2	2,106	2
August		...	4	7,003	10	2	2,198	2	...	...	...	2	1,534	2	1	1,415	1	1	9,278	3	5	2,511	10	3	2,545	12
September		...	2	3,437	8	5	3,303	6	...	...	...	...	...	...	...	...	...	1	641	1	7	5,321	12	2	1,112	3
October		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
November		...	2	1,637	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1,093	1	...	...	...
December		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total...	—	—	—	—	22	—	—	12	—	—	2	—	—	7	—	—	2	—	—	4	—	—	30	—	—	18

* The districts here referred to are Zemindary estates, and the particulars as to the number of villages are not at hand.—(W. R. C.)

Table showing the particulars of Cholera Deaths in the different Talooks and Municipal Towns of the Vizagapatam District during each month of the year 1870.—(Continued.)

Vizagapatam District.	Vizianagram Municipal Town.			Vizianagram Talook			Srungavarpu cotta.			Bimlipatam Municipal Town.		Bimlipatam Talook			Veravilly.			Vizagapatam Municipal Town.			Vizagapatam Talook.			Ankapally.		
Population	14,046			93,134			102,232			5,192		80,674			128,545			16,867			84,066			150,251		
Total number of Villages in each Circle.	——			1,874			*			*		*			*			*			*			38		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	Population of affected Village.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
February	...	...	...	1	591	2	...	...	...		...	1	172	1	...	...	...	...	...	...	1	2,167	1	...	...	...
March	...	...	...	...	...	...	1	1,185	1		...	2	2,702	2	...	...	...	...	...	...	..	...	...	...	...	...
April	...	...	...	1	495	1	...	...	...		...	2	2,064	2	...	...	...	...	...	...	1	1,300	2	...	...	...
May	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
June	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	1	840	7
July	...	...	...	2	4,337	23	1	1,127	1	5,192	...	2	2,828	34	...	...	...	...	...	...	1	1,997	2	3	7,657	4
August	..	...	...	2	3,003	28	3	1,783	5		...	1	2,410	1	2	2,888	2	...	...	...	2	977	2	...	...	..
September	...	...	...	3	4,312	3	3	6,242	6		2	3	6,023	3	...	...	...	1	16,867	3	2	2,871	2	2	1,834	2
October	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
November	...	...	..	2	1,718	2	...	...	...		...	3	2,543	3	2	3,090	2	1	16,867	4	1	712	2	1	976	5
December...	...	...	...	...	...	...	2	5,572	2		...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Total...	—	——	—	—	——	59	—	——	15	——	2	—	——	46	—	——	4	—	——	7	—	——	11	—	——	18

Table showing proportion of Deaths to 1,000 *of Population in the different Talooks and Municipal Towns of the Vizagapatam District, during each month of the year* 1870.

Talooks and Municipal Town.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Palcondah Municipal Town	...	...	...	...	...	...	...	...	...	...	...	...	...
Palcondah Talook ...	...	0·01	...	...	...	...	...	0·07	0.06	...	0·01	...	0·16
Survasidy ,, ...	...	...	...	0·009	...	0·02	...	0·01	0·05	...	...	...	0·11
Golcondah ,, ...	...	...	...	...	...	...	0·02	...	...	...	...	...	0·02
Parvatipore ,, ...	...	...	...	0·03	...	...	0·008	0.001	...	...	...	...	0·05
Bobbilli ,, ...	...	...	...	...	...	...	0·008	0·008	...	...	...	...	0·17
Salur ... ,, ...	...	...	...	...	...	...	...	0·04	0·01	...	...	...	0·06
Chiparapilly ,, ...	...	0·01	0·01	0·006	...	...	0·01	0.06	0·07	...	0·006	...	0·18
Gajapatinagrum ...	...	0·01	...	...	...	...	0·02	0·14	0.03	...	...	...	0·21
Vizianagram Municipal Town. ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vizianagram Talook...	...	0·02	...	0·01	...	...	0·2	0·3	0·03	...	0·02	...	0·63
Srungavarapu cottah...	...	...	0·009	...	...	...	0·009	0·04	0·05	...	...	0·01	0·14
Bimlipatam Municipal Town	...	...	...	...	...	...	...	...	0·38	...	...	...	0·38
Bimlipatam Talook...	...	0·01	0·02	0·02	...	...	0·4	0·01	0·03	...	0·03	...	0·57
Veravilly ,, ...	...	...	...	...	...	...	...	0·01	...	...	0·01	...	0·03
Vizagapatam Municipal Town	...	...	...	...	...	...	...	...	0·1	...	0·2	...	0·04
Vizagapatam Talook...	...	0·02	...	0·04	...	...	0·04	0·04	0·04	...	0·04	...	0·13
Ankapally	...	...	...	...	...	0·04	0·02	...	0·01	...	0.03	...	0·11

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104. GANJAM DISTRICT.—While I am relating the history of cholera in the Northern Districts it may be as well to mention that Ganjam, the district which lies nearest to, and is apparently a part of, the endemic field of cholera, had no epidemic during 1870. The reported deaths were exceedingly few. The following tables give all the necessary particulars in regard to this district. Whether the slight increase of mortality in the month of August was due to the northern extension of the Godavery epidemic, or to mere seasonal influences, the facts at my disposal do not enable me to say. As cholera finds an apparent difficulty in moving downward from the endemic area through this district to localities in the south, it may be that it does not readily advance upward, but the experience of more years is necessary to settle the point.

Table showing particulars of Cholera Deaths in the different Talooks and Municipal Towns of the Ganjam District during each month of the year 1870.

Gangam.	Goomsoor Talook.			Berhampore Municipal Town.		Berhampore Talook.			Chicacole Municipal Town.		Chicacole Talook.			Zemindaries.		
Population.	134,832			20,570		194,079			14,686		139,907			733,135		
Total No. of villages in each Circle.	1,090			——		670			——		1,081			2,941		
Months.	No. of villages affected.	Population of affected villages.	Cholera deaths.	Population.	Cholera deaths.	No. of villages affected.	Population of affected villages.	Cholera deaths.	Population.	Cholera deaths.	No. of villages affected.	Population of affected villages.	Cholera deaths.	No. of villages affected.	Population of affected villages.	Cholera deaths.
January	3	1,168	3		1	3	3,325	3		...	...	...	...	...	..	..
February	...	...	...		...	...	...	...		...	...	...	...	2	3,068	3
March	2	492	3		1	1	500	1		...	1	925	1	2	2,912	2
April	2	670	5		...	1	775	1		...	1	819	1	4	3,851	5
May	1	887	3		...	1	4,587	2		...	1	314	1	7	2,130	8
June	4	1,472	5	20,570	2	...	...	...	14,686	...	1	857	1	1	692	1
July	6	3,192	8		...	2	2,859	2		...	3	ı,615	3	9	8,736	33
August...	3	1,010	6		10	6	9,739	9		1	5	6,499	6	25	21,737	166
September	...	...	...		6	4	5,032	11		2	1	349	1	8	4,113	46
October	...	...	..		...	...	...	...		...	1	119	1	1	1,542	1
November	...	...	...		...	1	2,101	1		...	1	568	1	...	...	...
December	1	609	2		...	2	1,368	7		...	1	300	1	4	365	5
Total ...	—	——	35	——	20	—	——	37	——	3	—	——	17	—	——	270

Table showing proportion of Cholera Deaths to 1,000 *of Population of the different Talooks and Municipal Towns of the Ganjam District, during each month of the year* 1870.

Talooks and Municipal Towns.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Goomsoor Talook ...	0·02	...	0·02	0·03	0·02	0·03	0·05	0·04	...	...	...	0·01	0·26
Berhampore Municipal Town	0·04	...	0·04	...	...	0·09	...	0·4	0·2	...	0·005	0·03	0·97
Berhampore Talook ...	0·01	...	0·005	0·005	0·01	...	0·01	0·04	0·05	...	...	...	0·19
Chicacole Municipal Town	...	...	...	...	...	...	...	0·06	0·1	...	...	...	0·20
Chicacole Talook ...	...	...	0·007	0·007	0·007	0·007	0·02	0·04	0·007	0·007	0·007	0·007	0·12
Zemindaries	...	0·004	0·002	0·006	0·01	0·001	0·04	0·2	0·06	0·001	...	0·006	0·36

105. I have now reviewed the condition of all the districts subjected to a new invasion of cholera in 1870. The next chapter will be devoted to an account of the districts, in which cholera was renewed, or reproduced, during the same period.

CHAPTER V.

REPRODUCTION OF CHOLERA IN A PORTION OF THE TRACT INVADED IN 1869.

Cholera existing in North Arcot, Nellore, Salem, and Madras Districts in January 1870.

106. The cholera of 1869 was still smouldering in the districts of North Arcot, Nellore, Salem, and Madras at the beginning of the year 1870. As regards the North Arcot District it was prevalent, but not very active, in the Zemindary tracts to the north-east of the district, towards Nellore, and also in Old Arcot. In the town of Nellore the disease was more common than usual in February, when fifty-seven deaths occurred. It died out here and in the district about the middle of March, and has subsequently had but a slight prevalence. In the Madras District, cholera was still prevailing at Conjeeveram in January, but it faded out in February. In the town of Madras the cholera deaths in January were thirty-seven, but here the disease diminished during February, and the only noticeable occurrence was a very local outbreak in a portion of the barracks occupied by H. M.'s 45th Regiment in Fort Saint George, the circumstances of which outbreak will be noticed hereafter. In the Salem District cholera was prevailing to some extent in the month of January. In the cholera report for 1869, the affection of this district was traced to importation by pilgrims travelling westward from Tripatty.

Decay of the epidemic in February.

Disappearance of cholera in March and April.

107. North Arcot.—At the end of April I proceeded to Vellore, Arcot, and Wallajahbad to inspect the Municipal towns, and remained at Vellore and Arcot until the 2nd May. Up to this date the neighbourhood was quite free of cholera. The weather was unusually hot and dry; the land winds from the west blew strongly all day, but towards the afternoon thunder clouds gathered in the north-west, and dust storms with lightning and thunder, but no rain, came up nearly every evening. Although no rain fell at Vellore and Arcot up to this time, it was evident that the spring rains (mango showers) were falling all about the hills to the north of the district, as may be seen in the following record of mean rain-fall in the several talooks :—

Table showing the amount of Rain-fall in April 1870, in the North Arcot District.

Talooks.	In April.		Since January 1st.	
	Inches.	Days.	Inches.	Days.
Arcot	...	...	1·75	4
Chendragherry	0·02	1	2·27	5
Chittoor	1·30	3	4·65	9
Gudiatum	...	...	1·40	2
Palmanair	0·45	1	1·15	3
Polur	...	...	0·20	1
Vellore	...	...	0·50	5
Wallajah...	...	...	......	...
Wandewash	...	...	10·5	4
Average......	0·20	½	1·44	4

Outbreak in Chittoor on 2nd May.

108. On the evening of the 2nd May the first case of cholera of the season occurred in Chittoor, the suddur station of the district. The two first persons attacked had been, one for twenty days, and the other a month in Chittoor, though neither were residents of the place.

There is no history of these persons having been in recent contact with travellers, though pilgrims were at the time passing through the town on their way to Tripatty.

Outbreak in Vencatagherry, Palmanair, and Tripatty on the same date.

109. The death registers show that on nearly the same date that cholera broke out in Chittoor, deaths occurred in the north-east of the district, in the Zemindary town of Vencatagherry, at Palmanair, on the south-eastern edge of the Mysore table-land, and at Tripatty where pilgrims were assembling for high festival. These several places lie wide apart, and the outbreak occurring precisely at the same time in them seems to prove that the cholera was a cholera of reproduction, brought into life again, in all probability, by the spring rains then falling irregularly over the hilly tracts of the district. At Tripatty the Police reported thirty-four deaths occurring between the 3rd and 5th of May, but the information regarding the actual out-break at this station is meagre and unsatisfactory. The Superintendent of Police of the district was absent, and his *locum tenens* could give no information of any value. Yet it is a fact well known to the Railway authorities that cholera appeared there in a very virulent form, and that the people rapidly dispersed during the "Gunga Jathra" festival, which lasted from the 5th to the 11th May. The great feast of Conjeeveram in the Madras (Chingleput) District, a town in direct railway communication with Tripatty, began on the 11th of May and continued for ten days, and the Tripatty pilgrims went in large numbers direct from the latter to the former town, many by rail, and many also by the ordinary roads. The Superintendent of Police observes, "since the dispersion of the pilgrims from Tripatty, cholera has been rife along the road from Tripatty towards Madras, cases having been reported from Vadamulpett, (Narnaveram) Puttoor, Naggery, and Trittany."

Tripatty festival.

Conjeeveram feast following close upon Tripatty feast. Movement of pilgrims by railway and road.

It may be well, before going any further, to examine the dates of the first cholera deaths in these places :—

Puttoor (on the railway)	May 6th
Naggery	do. 21st
Trittanny	do. 21st
Vadamulpett.	do. 22nd
Narnaveram..	do. 22nd
Vellore	do. 29th
Punganoor...	do. 31st

It is evident from these dates that the towns on high roads leading to Madras, and other places, were slowly affected, long after a body of cholera had been taken on to Conjeeveram by the pilgrims travelling by rail. Cholera, as has already been stated, was smouldering in villages of the North Arcot District all through the early months of the year, when it broke out with virulence in the month of May. In Chittoor, Palamanair, and Venkatagherry, where it appeared at precisely the same time as at Tripatty, it had no long continuance; at Chittoor deaths occurred on the 3rd, 4th, 5th, 11th, and 12th of May; at Venkatagerry on the 2nd and 3rd May; and at Palamanair on the 3rd May only.

At Tripatty the revitalised cholera found in the assembling pilgrims a nidus for further ravages, which was apparently wanting elsewhere in the district, for

it was from this centre that a virulent cholera proceeded along the high road towards Conjeeveram, and possibly in other directions also, if it were possible to get at the facts.

110. It will be observed from the district table that the cholera mortality of North Arcot went up from a total of ninety-nine deaths in April, to 935 in May, but the best mode of showing the progress of this revived cholera on a large scale will be to give the deaths in North Arcot and adjoining districts for the several months of the year.

Districts.	North Arcot.	Chingleput (Madras District.)	Madras City.	Nellore.	Salem.
Population	1,780,616	804,283	450,000	11,68,664	16,19,233
Cholera Deaths.					
January	83	117	37	141	560
February	102	54	15	180	443
March	98	8	9	112	271
April	99	16	48	9	215
May	935	287	79	...	126
June	899	551	391	10	206
July	334	152	113	27	567
August	389	72	121	20	521
September	176	63	20	76	172
October	113	35	22	20	69
November	227	19	3	14	40
December	140	20	3	4	319
Total...	3,595	1,394	861	613	3,509

The figures show that the reproduction of cholera in the North Arcot District was apparently aggravated by the dispersion of pilgrims, and that the neighbouring districts became affected by this reproduced cholera at a later date than North Arcot. It is evident that cholera, which had never completely died out from the 1869 invasion, first showed itself in strength in the month of May, in the North Arcot District, and that it attained its maximum of intensity in the Chingleput and Madras districts in the following month, viz., June, and in Salem, to the westward, a month later, or in July. It is worthy of remark also that the reproduced epidemic never reached Nellore District in any force. During the greatest intensity of cholera in North Arcot (May) there was not a single death from it in the Nellore District, and in the following months the deaths were insignificant. The railway and high road bring the Cuddapah District also into direct contact with the infected centre of Tripatty, and it is curious to observe how little the cholera influence was felt in that district. The few deaths, it may be noted, occurred chiefly in the talooks through which the line of railway passes, or adjoining the eastern border of the Mysore Country.

Cuddapah District slightly affected only by pilgrim dispersion.

District.	Population.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Cuddapah ...	1,144,759	...	...	...	...	31	50	29	10	8	6	...	...	134

Here we see that cholera, after a disappearance of eight months, suddenly lights up again in May coincidently with the dispersion of persons from an affected pilgrim site. Cuddapah having suffered from a slight invasion of cholera in 1869 was this year comparatively free. The district moreover was largely suffering from the presence of malaria, and I believe it to be a fact that cholera influences cannot lay hold of a locality that is at the time under some other morbific influence, such as fever or small-pox.

Communication between Tripatty and Conjeeveram.

111. The great stream of human intercourse during the first ten days of May was from Tripatty to Conjeeveram, and places to the southward, and we shall see that Conjeeveram, distant about sixty-five miles from Tripatty, and reached by railway in a few hours, was not long behind Tripatty in giving evidence of cholera.

Outbreak in Conjeeveram during the great festival. Particulars of early cases.

The first case in Conjeeveram occurred on the 6th of May, five days before the feast commenced, but not before the pilgrims had begun to arrive at the town. Mr. Chadwick, the Medical Officer of the station, thus describes the advent of cholera :—

"On the evening of the 8th May 1870, private information reached me of the existence of cholera in a suburban hamlet, a mile distant from the town on the south-east. Almost immediately with this information came a letter from the Town Sub-Magistrate, apprising of the death by cholera of two persons in this village. Next day I proceeded to the village and inspected the dwelling where the cases occurred. The information I elicited on the spot was as follows :—

"On the morning of Friday the 6th of May, a man of the Gentoo Pollicar caste, aged about forty years, was attacked and died about 2 o'clock the same afternoon. His son, aged four years, was attacked between 11 and 12 o'clock the same day and succumbed within an hour after the death of the father. Neither parent nor child had gone out of the village anywhere. There was no cholera about the surrounding villages, no fresh arrival of any person; in short, nothing that could afford the impression of the importation of the disease. The village does not lie in the line of traffic, and is accessible by carts with some little difficulty.

"Almost every villager was questioned by me as to the existence of loose-bowels among them, and their replies induced me to conclude that these were but sporadic cases."

Mr. Chadwick notes that the village was very dirty, a mass of refuse and manure, and the hut in which the cholera cases occurred was horribly offensive, surrounded by cess-pools, seething from the heat of the weather.

The village was vigorously cleansed under Mr. Chadwick's direction, and not another case of cholera occurred in it.

11th of May, date of outbreak amongst pilgrims in the town.

112. On the 11th of May cholera appeared within the town, in the person of a woman who was a visitor to the feast, from a place called Siddamburam in the Cuddalore District. She arrived about a week previous to the above date, in company with a gang of mendicants, of whom she formed one. On the same day a case of choleraic diarrhœa presented itself in the person of another visitor to the feast from Chittoor. On the 13th May a pilgrim from Chittoor died of cholera. This man had come in company with the preceding case. The festival actually began on the 12th of May, and from the 11th of May to 1st July cholera continued to prevail in the town.

Incidence of the outbreak at Conjeeveram.

Mortality trifling.

There were 160 cases coming under the Medical Officer's observation and forty-nine deaths. Mr. Chadwick in his report speaks highly of the value of acetic acid in the treatment of cholera. From the Mortuary Register I observe that fifty-three deaths occurred in May, thirty-six in June, and three in July, or in

all ninety-two. The number is not large, considering that about 30,000 visitors are supposed to have attended the festival; but it must be remembered that the town register takes no account of the pilgrims who sickened and died after leaving the town. Owing to the drought, scarcity of water, and recent sickness in the town (cholera continuing from the former importation in October 1869 to February 1870) the Collector had issued a warning to the Hindu public of the risks they ran in visiting the town. In consequence of this notice the number of pilgrims fell short of the average attendance at the May festival, which in some years has brought 130,000 persons together.

State of weather during the outbreak.

As to the meteorology of Conjeeveram at the time of the outbreak, Mr. Chadwick notices that he had no instruments for recording temperature, &c.; but that "the hot winds were unbearable," chiefly south-west, occasionally veering to north-west. On the 15th May a very slight fall of rain occurred, and again on the 20th; on the 31st rain fell pretty heavily for the first time, lasting about half an hour.

"I cannot say whether the progress of the disease was in any way affected by these showers, as there was no marked increase in the number of admissions and deaths, neither was there a sudden cessation of the epidemic influence, the disease continuing to prevail all through June and July, when it quite disappeared."

Distribution of cholera to surrounding districts by pilgrims.

113. To understand how the association of large numbers, as at Tripatty and Conjeeveram, is injurious to the country at large, we must now turn to a narrative drawn up by Lieutenant Price, Assistant Superintendent of Police, North Arcot District. This gentleman recorded the facts after personally visiting the villages which had been affected by the Conjeeveram pilgrims in returning from that place.

Narrative of the Assistant Superintendent of Police, North Arcot District.

"The first chord struck by this terrible scourge in the sub-division of the North Arcot District was at the village of Doshee, situated three miles to the south of the town of Conjeeveram (resulting in the speedy death of the attacked), and the reverberations of the same have now unhappily filled every talook of the sub-division.

"I regret that at present I am not in possession of the minute facts necessary for a detailed report on the commencement of the plague and its progress in talooks other than that of Vellore. These facts I hope to glean in a few days, and if the Sanitary Commissioner considers them worth recording, I shall be happy to place them on record."

Vellore Taluq.

"The first case in the talook under report occurred on the 12th of May, when a cholera-stricken Reddy, *en route* to his home from Conjeeveram, died at the village of Kistnaveram. On the 14th May the destroyer presented himself at the village of Munnoor, situated about one mile from Kistnaveram, and there claimed, as his victims, three children. Police Inspector Kistnasawmy was on the spot, and by his solicitations the parents allowed the children to be treated with cholera pills furnished from the Vellore Dispensary. The results were happy. One child succumbed, while the other two are now rapidly progressing towards convalescence.

"After the disease had made its appearance in these two villages, it suddenly became apparent in the villages that lie adjacent to the roads passing through contiguous Police Divisions of Amboor and Vepuncoopum, and which lead into Salem District, viâ Vaniembaddy and Alangyum, respectively.

"Both these roads are much frequented by the pilgrims going westward from Conjeeveram, and who, from inquiries made, seem to have been the carriers of the disease. The road from Vepuncoopum to Alangyum lies over precipitous ghauts and through heavy jungle, where water is scarce.

"The extra fatigue and privation forced on the half-starved wretches who pass by this route might possibly predispose them to attacks of cholera, but on this point I can offer no opinion,

Suffice it to say that travellers by this route have suffered severely. The dead are buried or burned at distances which vary from half to quarter of a mile from the high way, but I regret to record that the fetid clothes of diseased persons, which, in many cases have been covered with vomit and excrement, are not parted with or destroyed, but are carried on until water is reached, there washed, and perhaps ere they are yet dry, the owner will have slaked his thirst at the very pool which he has just impregnated with filth the most deadly. This washing has been stopped by the Police as far as they can do so, but the sad fact remains that the people will not part with or destroy these clothes which help to engender and spread the scourge. The motions and vomit of an affected person are thrown carelessly on one side. No attempt at burying them is made, though the efficacy of doing so has been strongly urged on the people, who also seem to have but little faith in our medicines, and when attacked prefer either to meet their 'luck' quietly, or take medicines prescribed by Native Physicians. The Police have done their utmost to combat these fallacies, but have in many cases failed to produce any good effect.

"Thus far I have dealt only with the disease to the westward of Vellore. It spread also to the southward, and on the 20th of May, a corpse was discovered in a nullah near Curcumbaddy, and was recognized as a pilgrim from Conjeeveram, who had been attacked with cholera in Curcumbaddy and taken on by his friends towards Arnee. The corpse was interred by the Police at a secure depth. And on the 23rd cholera made itself felt in the village of Chattery, situated about one mile south of the Central Jail (Vellore). Here a female pilgrim from Conjeeveram was attacked, and succumbed in a few hours; a male who had also come from Conjeeveram with her, died in an equally short time. Two other cases appeared in this village, but gave way to treatment by a Dresser sent there by Dr. Fox.

"It will be seen that in every case in this talook the curse is traceable to the Conjeeveram pilgrims who appear to have carried the germs of the disease with them and spread it unsparingly. No fresh cases have been brought to notice lately, and the disease appears to be dying out."

Lieutenant Price's further report is as follows :—

"The first case of cholera in the Arcot Talook was also the first case in the North Arcot Sub-division. A pilgrim who had come from Tripatty to Conjeeveram, and was returning from the latter place to the south, was attacked on the 10th of May at Doshee, situated about four miles south of Conjeeveram. The victim in this case belonged to a large party of pilgrims, and on the 11th of May, two more of the party were attacked and abandoned on the road-side, about half a mile south of Mamandoor; these two cases were fatal. On the night of the 13th of May, a party of Conjeeveram pilgrims halted at Tetry, about twelve miles south of, and on the same road as Doshee. On the morning of the 14th, one of them was attacked with cholera, put in a cart and taken away by his party; his fate is unknown. Simultaneously with his being attacked, two children were seized with the disease and died. Within the week three more fatal cases occurred in this village. It then spread to the east, and two cases occurred in Mailma, situated one mile east of Tetry. It would appear that the villagers of Tetry took the disease there, as they were in the habit of continually going there. The next case occurred at Vundanagoor, still keeping to the south and on the line frequented by the returning pilgrims from Conjeeveram. The attacked in this case was a pilgrim from that place; he recovered.

Arcot Taluq.

Still holding to the southward the disease made its appearance at Wandewash on the 26th of May, where a Conjeeveram pilgrim was attacked. His treatment was immersion in a cold tank and copious drenches of cold water; he recovered. On the 30th, the disease seemed to have radiated from Wandewash and became apparent at Theelar, eight miles south; Pernameelore, twelve miles west; Trivatore, eleven miles north-west; and Parasoon, about five miles south-west. At the first named village, five villagers were attacked and died. These men were not Conjeeveram pilgrims, but the cholera-stricken pilgrims had passed through and halted at the village, and seem to have left the taint behind them. At the second named village, two Conjeeveram pilgrims were attacked and succumbed; at the fifth named village, one man and two children, Conjeeveram pilgrims, were attacked and died; and at the fourth, two Conjeeveram pilgrims were attacked and recovered. All the villages (excepting Parasoon and Trivatore), whose names I have given, lie on the roads that are the feeders to Conjeeveram. They have all been visited by me during this month, and no want of sanitary arrangement was perceived, nor were they in a dirty state, excepting the village of Mamandoor. The disease is clearly traceable in these talooks to Conjeeveram. In every case, except at Theelar, the victims have been pilgrims, and even at Theelar the presumption is strong, that the curse was brought by these pilgrims who halted there and passed on to

Wandewash.

Cholera had been prevailing in Arcot all through the cold season.—(W. R. C.)

the south. In Arcot, however, prior to the passing through of any pilgrim, the disease appeared, and on the 12th of May and on subsequent dates a case here and there was seen. It died out in a few days. Since the passing of pilgrims through the town, it has again appeared, and on the 18th of this month, it broke out with great severity, carrying off five victims in one day.

114. We gather from this record that cholera was scattered far and wide over the country by the pilgrims returning from Conjeeveram. The facts have been recorded by Mr. Price, not to support any theory, but simply with the view of describing occurrences coming under his own observation. The story of the Tripatty and Conjeeveram pilgrims in 1870 is true of all such bodies of human beings, in relation to cholera, in all other years when a new invasion or reproduction of the disease takes place, whether the facts be ascertained and recorded, or whether they be left unnoticed. To argue that cholera in seasons of reproduction or invasion is not aggravated by the assemblage of crowds of human beings at the religious festivals of the country, is to ignore plain truths that the people themselves admit to be unquestionable.

Extension of cholera from Conjeeveram to Tripatore in the Salem District.

115. Before I conclude these observations on the influence of places like Tripatty and Conjeeveram in the distribution of cholera, I have to notice the spread of the disease to the talooks of the Salem District adjoining North Arcot, and for the details I am indebted to Mr. Overbury, the Head Assistant Collector of the district, residing at Tripatore, where cholera appeared in a very severe form.

Mr. Overbury states,

Mr. Overbury's report.

"About the 25th of May last, there occurred two or three isolated cases of cholera in Vaniembaddy and Jolarpett (station towns on the South-West Line of the Madras Railway.) The disease in the former town was, I believe, introduced by the pilgrims by the Madras train. (The Conjeeveram pilgrims join the Madras train at Arconum.) At the latter place it was proved to have been introduced. Mr. Reid, however, the Locomotive Superintendent and Manager, took such steps as to prevent its spreading to the adjacent villages, and his endeavours were attended with success.

"No other case occurred until the 26th June. A wealthy native in Tripatore had invited a large number of friends from Conjeeveram, and other places in its vicinity, to celebrate a marriage. On the first night of their arrival in Tripatore, cholera broke out in the said native's house, and the disease spread simultaneously, radiating over the talooks, penetrating even the Javady Hills (a range south-east of Tripatore, ranging from 3 to 4,000 feet in height.) It ultimately passed away on the 3rd September, the time occupied in its progress being three months and a half."

Mr. Overbury furnishes the following list of places attacked, with dates of first cases. The list is correct so far as it goes, though it does not include every place attacked by cholera in his sub-division. It will be noticed that the dates of attack are such as to preclude the idea of a simultaneous outbreak, depending on climatic or general causes affecting the whole district. The town of Tripatore, of 10,381 inhabitants, was attacked on the 26th June, and according to the Police returns, eighty-nine deaths, and by the Revenue Register ninety-four deaths, occurred in it during the month of July, the last death occurring on the 5th August. The town of Salem, 100 miles to the south-west, was slightly affected in May, fifteen deaths occurred here from the 10th to 24th of the month. Cholera did not spread on this occasion, but from the 30th of July to the 13th of August there were fifty-nine deaths in the town. Although the direct channels of introduction could not in either case be traced, it seems most probable that the May cholera was an extension from Tripatty, and the July and August cholera from the affected talooks to the eastward. While the disease was raging at Tripatore all through the early part of July, the town of Salem was absolutely free of it.

Outbreak in Salem.

Mr. Overbury's Table of Cholera in Tripatore Talook with dates of outbreak.

Talooks.		Villages.	Number of persons that			Date of first attack.
			Attacked.	Recovered.	Died.	
Tripatore.	1	Tripatore	167	105	62	26th June 1870.
	2	Keel Kuppum.	24	20	4	16th July 1870.
	3	Naravinthampatti.	2	1	1	Do.
	4	Nallapatharampatti.	1	...	1	Do.
	5	Kandalli.	9	2	7	Do.
	6	Param Pett.	1	...	1	18th do.
	7	Bomwa Kuppum.	5	...	5	20th do.
	8	Chinnarapett.	20	9	11	Do.
		Total...	229	137	92	
Utengerry Talook.	1	Paparapatti.	3	2	1	20th July 1870.
	2	Kottapadi.	7	5	2	23rd do.
	3	Yelavadi.	3	...	3	24th do.
	4	Kunnathur.	13	7	6	26th do.
	5	Kudulpatti.	1	...	1	3rd Aug. 1870.
	6	Chinnagundanoor.	1	1	...	4th do.
	7	Kullani.	1	...	1	5th do.
	8	Kaudagundanoor.	1	1	...	3rd do.
	9	Nariganoor.	2	...	2	10th do.
	10	Utengerry.	1	1	...	11th do.
	11	Poodoor.	4	3	1	15th do.
	12	Appinaikunipatti.	4	3	1	15th do.
	13	Chinna Coonathur.	2	1	1	23rd do.
	14	Motur.	2	1	1	29th do.
	15	Atiniseeanipatti.	1	1	...	Do.
	16	Tadampatti, near Haroor.	2	2	...	Do.
	17	Terunanumpatti.	20	7	13	13th Sept. 1870.
		Total...	68	35	33	

CHOLERA IN SALEM DISTRICT.

116. In the special cholera report for 1869, I showed that an invasion of the district had occurred from the eastward, consequent on the dispersion of affected pilgrims from Tripatty, in September 1869, and that both Salem and Coimbatore had apparently been affected by railway travellers, the earlier cases having, in both instances, occurred at the railway stations. At the end of 1869 cholera was mostly localised in the Salem Talook, but prevailing also in Kistnagherry and Trichengode Talooks. During the early months of 1870, there was considerable prevalence, but by April and May it had considerably abated, except in the Salem Talook. The month of June witnessed an increased development of cholera, especially in the higher lands of the district, forming a portion of the Mysore plateau. Cholera at the same time was increasing in the adjoining districts of the province of Mysore. In July a large increase of mortality took place in the Tripatore, Kistnagherry, and Oossoor Talooks, and this local development of cholera must be considered in relation to Mr. Overbury's narrative of the westward extension of the outbreaks amongst the Tripatty and Conjeeveram pilgrims. Cholera generally abated in the district in September; at the end of the year it was prevailing with force only in the Namcul Talook, which up to December had hardly been affected at all.

Cholera in the higher talooks.

The annexed tables give all the particulars as to the affection of the several talooks of the district, and the chief point of interest is the very local character of the epidemic throughout the year, the intensity varying in each talook, not so much in accordance with any general seasonal peculiarity, as has been observed in regard to some other districts.

Table showing particulars of Cholera Deaths in each Municipal Town and Talook of the Salem District during each month of the year 1870.

—	Kistnagherry Talook, N. of District.			Tripatore Talook, N. E. of District.			Uttengherry Talook, E. of District.		
Population ...	132,515			151,845			127,084		
Total No. of Villages in each Circle ...	750			485			680		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January	23	14,094	95	4	6,031	43	...	...	...
February	22	14,215	63	17	13,898	105	1	620	1
March	14	4,244	67	3	3,054	5	6	3 982	11
April	8	2,076	13	1	491	1	4	3,283	8
May	...	...	...	6	18,414	13	1	1,404	6
June	8	3,126	28	14	16,507	30	2	1,110	15
July	40	17,369	128	42	30,092	258	5	3,635	8
August	17	8,676	68	31	35,674	102	11	5,948	26
September ...	4	5,384	29	11	13,774	20	4	2,115	35
October	6	6,175	24	7	8,774	13	...	...	...
November ...	3	3,020	8	...	...	...	3	572	8
December ...	6	4,259	18	4	7,452	8	2	1,443	16
Total ...	-	——	541	-	——	598	-	——	134

—	Ahtoor Talook, S. E. of District.			Namcul Talook, S. of District.			Trichengode Talook, S. W. of District.		
Population ...	126,814			222,784			209,803		
Total No. of Villages in each Circle ...	309			724			588		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January	9	18,293	28	8	5,556	24	36	21,098	97
February	12	17,900	41	1	378	1	20	19,398	43
March	22	31,881	47	1	2,372	1	10	8,448	19
April	4	4,992	5	6	3,559	48	7	4,954	19
May	5	5,046	12	2	5,110	2	2	1,613	8
June	1	893	1	1	179	1	...	...	...
July	4	3,488	12	5	4,026	5	2	2,042	2
August	17	20,111	38	9	9,316	14	24	8,360	76
September ...	10	15,183	16	6	3,380	11	14	11,534	26
October	...	...	...	8	8,679	9	6	2,197	12
November ...	...	...	...	5	4,244	14	1	602	2
December ...	7	13,706	35	36	37,536	230	1	628	1
Total ...	-	——	235	—	——	360	—	——	305

—	Salem Municipal Town, W. of Talook.		Salem Talook, W. of District.			Dharmapoory Talook, W. of District.			Oossoor Talook, N. W. of District.		
Population ...	33,072		284,712			161,067			169,537		
Total No. of Villages in each Circle ...	——		707			933			1,820		
Months.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of Villages affected.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January		30	70	66,444	238	...	...	...	5	1,338	5
February		13	42	35,571	132	7	11,069	24	3	1,900	20
March		2	28	28,299	80	19	11,748	30	8	1,504	9
April		...	19	13,639	64	8	5,666	30	2	1,918	27
May		15	19	17,316	78	3	895	5	1	329	2
June		...	18	8,676	62	5	3,370	16	17	8,388	53
July	33,072	18	7	3,816	10	6	8,696	9	25	14,032	117
August		19	60	66,153	120	3	2,483	15	7	2 152	43
September ...		1	13	10,122	23	5	6,300	9	2	1,613	2
October		...	5	2,903	10	1	327	1	...	...	...
November ...		...	...	...	...	2	1,284	8	...	...	...
December ...		...	4	2,740	5	3	1,094	6	...	...	...
Total ...	——	98	—	——	822	——	——	153	—	——	278

117. From the figures it may be surmised that cholera moves but slowly in this district, for the intensity of the epidemic which occurred in the Salem Talook in January, did not take place in Namcul until December. Whether the configuration of the district aids, or not, in retarding the movement of cholera, is a point of some interest. Any one who will take the trouble to examine a map of Southern India, in which the mountain ranges are defined, will be able to satisfy himself that the district is mainly surrounded by high mountains or table-lands; and that it contains within it a number of hill ranges, many of them from 4,000 to 5,000 feet in altitude.

Slow movement of cholera in some portions of the Salem District.

A portion of the district drains eastward to the Palaar, and another portion to the Cauvery valley, to the west and south. The highest point of table-land crossed by the railway in the section of the district, is at the northern base of the Shevaroy mountains, where the elevation is about 1,900 feet above the sea.

118. The Shevaroy range of mountains, to the north of the valley in which the town of Salem stands, may be taken as a type of the hill ranges of the district. They are composed of metamorphic rocks, which, if not bare and exposed, are clothed with but a scanty surface soil and stunted jungle. Water is got from streams, or wells sunk in ravines, and is usually very pure as regards organic matter. The summits of these hills, of 4,000 feet elevation or more, are not subjected to cholera invasion at all. The indigenous inhabitants have very little intercourse with the low country, and in regard to the European settlements on these hills, it is a well ascertained fact, that cholera, however severe and fatal it may be in the valley at the foot of the hills, does not prevail. An occasional case has occurred in persons who have lately arrived from the low country, but I have ascertained by reference to residents of twenty-five years' experience, that they have never known an outbreak amongst the hill people, or their own native servants, though, occasionally, persons in returning from Salem, or the low country, have died of cholera on the hills. In regard to malarious fevers the mountainous regions of the Salem District have no exemption, and when the hot season has been unusually prolonged, and the south-west monsoon has been delayed beyond its usual time, remittent and intermittent fevers of a very severe and fatal type have been known to occur. Some of the lower slopes of the Shevaroy Hills, and of the other hill ranges, are, I have reason to think, within the field of cholera invasion. Only in the last year Mr. Overbury records that the outbreak at Tripatore spread to adjoining villages, and invaded the Javady Hills, at the northern base of which the town of Tripatore stands. This range is of less elevation than the Shevaroys. But in regard to the plateau of the Shevaroy range, I think it may be affirmed beyond question that no "air-borne" cholera has ever fructified in that locality. Besides the testimony of living residents to that effect, I have consulted the recorded experience of every Medical Officer of the district, who has known the hills from 1823, down to the present time, and the result is conclusive, that cholera has never been known there, except in the form of isolated cases in arrivals from the low country.

Shevaroy Hills and their cholera immunity.

Salem hills liable to malaria.

119. Now the southern edge of the plateau, on which the sanitarium of Yercaud stands, is not more than five or six miles, as the crow flies, from the town and valley of Salem, in which cholera has always been noted for its great

prevalence. If the germs of cholera are wafted over the country by the monsoons, as insisted upon by Dr. Bryden, I may here ask why it is that in all the cholera history of Southern India, the inhabitants of this elevated plateau have never been "struck" by the cholera miasm ?

They have been repeatedly "struck" by the fever miasm, and, indeed, malarious fevers are the most common diseases of natives on the hills. The hill summits are freely exposed to monsoon influences. Clouds of the south-west monsoon roll over the hills and envelope them in mist and moisture, and yet while the people of the Western Coast, and of the country between Salem and that coast are dying by thousands of cholera, the residents of the hill plateau live in absolute security.

While I was residing on the Shevaroy Hills in June and July 1865, the inhabitants of Malabar were perishing by thousands in a week from cholera. The south-west monsoon, which blew over this cholera-stricken district, came over the Shevaroy Hills, enveloping them in its moist air, and yet the only case of cholera that occurred on the hills was in the person of an East Indian, who had come up from Calicut on the Western Coast to Salem, the day before, and who was seized with the symptoms of cholera as he began to ascend the Shevaroy Hill ghaut. The very remarkable instance of the Shevaroy Hills would seem to indicate, that if cholera is ever an air-conveyed contagium, the atmosphere has not the power of lifting it to any great height above the average level of the land, or of conveying it to any great distance. Cholera may be raging in the valley between the Shevaroy and Kollamally Hills, and yet fail utterly to gain a footing on the summit of one or the other range. In the case of the Shevaroy Hills, although the hill races keep very much aloof from the low country, there is constant traffic between the town of Salem and the hills. The road is not adapted for cart traffic, but some hundreds of coolies and bullocks pass up and down every week. The distance up and down is no more than a cooly can accomplish in a day, and yet with all this communication with a frequently infected locality, it is very rare to hear of a cooly dying of cholera upon the hills.

120. Whatever the true explanation may be, the fact remains that the contagium of cholera, even when brought up by the bodies of travellers, does not ordinarily spread by multiplication. If the contagium were widely diffused in the atmosphere during epidemic seasons, it is most improbable that some of the minute particles of which it is composed, should not be brought over the hills, exposed as they freely are to the influence of both monsoons. The mere elevation of the hills above the level of the surrounding country cannot account for the absence of cholera, because in the case of the Himalaya range, cholera has been known to prevail epidemically at a much greater elevation than the highest point of the Shevaroys. The explanation of the difference in the cholera-producing powers of Salem and the Shevaroys must, I think, be looked for, to some extent, in the physical differences of the two localities, and also in the fact that cholera flourishes best in low lying localities, when the subsoil moisture is never very distant from the surface. (Some facts in regard to Salem will be found in the Appendix.)

CHOLERA IN THE COIMBATORE DISTRICT.

Influence of the physical geography of the district, as contrasted with Malabar.

121. The position of the Coimbatore District, in regard to the phenomena of cholera distribution, is one of considerable interest. In common with the Salem District, it rarely suffers during the years of primary invasion (as in 1859, 1864, and 1869). The western portion of the district includes the high mountain ranges of the Neilgherry and Annamally Hills, and these, except in the narrow, funnel-shaped, pass at Palghaut, through which the high road and south-west line of Railway now run, completely cut off the district from the Malabar country below the western Ghauts. There is a wonderful difference in the climate, and the fauna and flora of Malabar and Coimbatore. Even the people of the western side of the ghauts are a different order of beings, in race, customs, and habits, to those of the eastern side. The former live habitually in a moist atmosphere, in which vegetation attains a luxuriance unknown in any other portion of Southern India. They do not group together in towns and villages (except in a few places on the coast), but each house is usually distinct, and overshadowed by the graceful foliage of the cocoa or areca palm, the jack-fruit, or plaintain. In every hedge-row and shady nook, ferns, lichens, and orchids abound, testifying to the humid nature of the atmosphere. The rainfall on the western side of the ghauts is contributed chiefly by the south-west monsoon, and the average fall is rarely below 100 inches, and in many places exceeds 150 inches in the year. The soil, a red laterite with sand and alluvium, is naturally fertile, and the careful cultivation of every nook of garden land with palms, pepper, coffee, and plantains, and the terracing and irrigation of rice fields on the hill sides and valleys, is a most pleasant sight to the eye, after the dry and barren-looking plains of Coimbatore on the eastern side of the ghauts. Yet, with all its natural wealth and profusion of vegetation, the Malabar Province is inimical to many forms of animal life. The horned cattle of the district are stunted, so that a Malabar cow is hardly bigger than a Leicester sheep. It is the fact that sheep do not thrive at all in this region of perennial moisture, and the human race is in many parts of the district held in check by the terrible malaria engendered in so much moisture and excess of vegetation. Epidemic small-pox pursues its ravages with a virulence unknown in the dryer regions of the Carnatic, and cholera, when it does invade the tract of the Western Coast, becomes a dire pestilence in the land. Happily for the people, these invasions do not occur oftener than once in four or five years, and when they do come, the outbreaks are not usually prolonged beyond the year, or the season, following that in which the invasion takes place.

Malabar.

Explanation of the arid character of the Coimbatore District.

122. The mountain barrier between Malabar and Coimbatore intercepts the rain clouds of the south-west monsoon, causing precipitation on the western side, while the districts to the eastward get scarcely any of this monsoon rainfall. Coimbatore immediately under the ghauts, on the east, is particularly deficient in rain during the south-west monsoon. The little it gets is in the form of stray showers, when the winds are variable. The chief rainfall of the district occurs during the north-east monsoon, when the rain clouds are kept back by the mountain barrier to the westward. Owing to its geographical position immediately to the eastward of the ghauts, it is for the most part a dry and barren district. The cultivation consists mainly

of dry cereals, cotton, tobacco, oil seeds, and pulses. Trees, except immediately under the mountain ranges, are scarce and stunted. The red and black soils are poor and thin. The cultivation is largely carried on by the aid of garden wells, sunk to a great depth through disintegrating gniess or schistose rocks. The well waters of the district are generally hard, and contain nitrates of lime and magnesia, in excess. The atmosphere is cooled and moistened by the south-west monsoon, though but little rain falls in the months of its prevalence. The average rainfall at Coimbatore is less than twenty inches in the year. In this district the cotton plant is cultivated with success. Sheep and cattle thrive well on the scanty herbage, and the climate is generally dry and healthful. In the mountainous tracts, and in forest belts between the mountains only, is the district markedly malarious. At long intervals of years, after unusual rainfall and inundation, the district has been known to be severely visited by fever. A great wave of malaria passed over it, and the adjoining Madura and Tinnevelly Districts, in 1809, 1810, and 1811, after a remarkable flooding of the country.

In this Coimbatore District, as before stated, cholera rarely advances during the years of a primary invasion. When the disease is very rife on the Palghaut side of the mountains, it advances up the gap in the mountain chain (the highway of rail and road traffic), and when the Mysore plateau is invaded by cholera, it overflows down the northern talooks of the district, but, I think, the more general course of invasion is by an ebbing, as it were, of the cholera wave attacking the southern districts of Trichinopoly and Madura, where the physical obstacles the progress of cholera are fewer. This at any rate was the general progress of cholera during 1870, the outbreak at Pulney in March, and in other parts of the Madura district in August, being sensibly felt in the adjoining parts of Coimbatore. The district had been almost free of cholera in 1869, when an outbreak occurred at the Railway station in September and October, clearly traceable to importation by pilgrims from the eastward.

Slight prevalence of cholera in Coimbatore District.

123. Cholera had but a very limited prevalence in the district in 1870. It hardly extended at all to the Collegal Talook, which adjoins the Mysore country, and forms a portion of the Mysore plateau. The following tables will show the distribution and ratios of cholera mortality to population :—

A.

Table showing the Deaths from Cholera in each Talook, &c., of the District of Coimbatore, during each month of the year 1870.

Coimbatore.	Collegal Talook.			Sattimungalum Talook.			Perindorai Talook.			Municipal Town Coimbatore.			Coimbatore Talook.		
Population ...	58,851			140,161			181,008			25,324			168,661		
Total number of Villages in each Circle.	475			884			1 416			...			732		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January	...	...	...	3	1,502	11	1	2,631	2			...	...	...	...
February	1	1,629	1	3	4,501	7	3	1,155	7			...	1	623	12
March	...	...	...	9	16,707	19	14	29,294	36			...	...	...	...
April	1	487	1	13	13,566	28	11	15,178	37			...	2	1,632	16
May	...	...	...	...	...	...	2	1,226	6			...	1	2,703	1
June	...	...	...	...	...	...	1	3,408	1			...	...	...	...
July	1	2,081	1	1	5,140	1	3	5,477	3		25,324	...	1	671	1
August	...	...	...	1	1,477	1	4	3,356	8			...	4	5,820	8
September ...	...	...	...	3	9,273	4	10	17,367	33			2	9	18,671	82
October	2	652	3	6	11,695	12	16	22,746	71			...	6	16,789	15
November ...	...	...	...	2	6,010	3	14	14,610	70			3	19	21,737	102
December ...	1	722	1	...	...	...	7	12,485	22			...	8	17,104	58
Total...		—	7		—	8[illegible]		—	296	—	—	5		—	295

Coimbatore.	Palladum Talook.			Caroor Talook.			Dharapooram Talook.			Pollachy Talook.			Oodoomala Pettah Talook.			Bhowany Talook.		
Population ...	202,583			137,536			174,662			133,234			97,531			74,031		
Total number of Villages in each Circle.	945			822			1,053			401			275			488		
Months.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.	No. of Villages affected.	Population of affected Villages.	Cholera Deaths.
January	...	...	...	.	...	...	1	2,487	10	...	...	...	8	11,822	57	1	1,401	2
February	...	...	...	1	2,187	1	3	7,399	27	1	3,050	1	2	3,694	3	6	13,296	38
March	4	8,842	4	8	17,733	35	18	48,333	78	6	9,830	15	1	3,627	2	2	5,073	2
April	3	7,368	5	9	23,991	52	12	28,237	44	3	3,761	6	3	3,533	4	...	...	...
May	3	2,861	13	6	11,109	23	6	17,401	17	...	...	...	...	...	...	...	...	...
June	...	...	...	1	3,087	1	...	...	...	1	1,556	1	...	...	...	1	671	2
July	...	...	...	...	...	...	3	10,331	4	...	...	...	1	1,829	1	4	3,369	7
August	1	1,034	1	...	...	...	2	6,511	2	5	6,171	37	2	4,746	3	...	...	...
September ...	17	32,847	41	6	12,128	20	5	11,676	16	7	15,213	61	1	880	2	1	4,595	3
October	46	71,180	270	15	39,496	69	16	38,513	105	11	8,063	32	4	5,066	43	1	944	3
November ...	17	28,247	78	12	29,830	29	17	37,416	80	9	9,244	65	3	5,844	16	...	...	...
December ...	13	23,113	68	17	21,219	64	9	20,640	44	6	8,731	15	2	5,665	8	2	5,842	4
Total...		—	480		—	294		—	427		—	233	—	—	139		—	61

B.

Table showing the Ratio per 1,000 *of Population, of Deaths from Cholera in each Talook, &c., of the District of Coimbatore during the year* 1870.

Talooks.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Collegal ...	...	0·01	...	0·01	...	...	0·01	...	...	0·05	...	0·01	0·1
Sattimungalum ...	0·7	0·4	0 1	0·1	...	...	0·007	0·007	0·02	0·08	0·02	...	0·6
Perindorai ...	0·61	0·03	0·1	0·2	0·03	0·005	0·01	0·04	0·1	0·3	0·3	0·1	1·6
Coimbatore M. T. ...	...	...	...	...	...	...	...	...	0·07	...	0·1	...	0·1
Coimbatore talook...	...	0·07	...	0·09	0·005	...	0·005	0·04	0·4	0·08	0·6	0·3	1·7
Palladum ...	...	...	0·01	0·02	0·06	...	...	0·04	0·2	1·3	0·3	0·3	2·3
Caroor ...	...	0·007	0·2	0·3	0·1	0·007	...	...	0·1	0·5	0·2	0·4	2·1
Dharapooram ...	0·05	0·1	0·4	0·2	0 09	...	0·02	0·01	0·09	0·6	0·4	0·2	2·4
Pollachy ...	...	0·007	0·14	0·04	...	0·007	...	0·2	0 4	0·2	0 4	0·1	1·7
Oodoomala Pettah...	0·5	0·03	0·02	0·04	...	...	0·01	0·03	0·02	0·4	0·1	0·08	1·4
Bhowany ...	...	...	...	...	...	...	...	...	...	...	...	...	0·8

124. The only talooks in which there was any noticeable prevalence of the epidemic were Pulladum, Dharapooram, and Caroor. The town of Coimbatore had only five deaths, although the disease was prevailing for some time in the surrounding villages. I arrived at the town on inspection duty on 6th September. Cholera at that time had got up so far as a village on the Noyel river, about three miles south of the town, where it continued for nearly a fortnight. On the 16th September a man was seized with cholera, who lived in the old fort. I had an opportunity of inquiring into the facts, in company with the Civil Surgeon.

Particulars of outbreak in the town.

125. The first patient was a weakly man, a tailor by trade, who had been working in company with other tailors at a house in the town, up to the date of attack. He had not been to a cholera-stricken village, nor could we trace any communication between the people he had worked with and any affected village. The house in which he lived was built on old and fouled soil. A cess-pit privy in the backyard was in an offensive state, and the well from which water was obtained was sunk within a few yards of the privy. The well water was decidedly contaminated by putrid organic matter, which I estimated by the potassium permanganate test to be in the proportion of ·560 grains per gallon, and the "readily decomposable" matter much larger still. This case rapidly died. Every precaution was taken to disinfect the privy and building, but the other inhabitants could not be induced to vacate the house, and two of them were attacked two days after the first case, and recovered. The second death in September was not reported until the body had been buried. I inspected the house in which it occurred, and found cess-pit privy and well in close contiguity. I am not convinced that the case was really cholera. No other case occurred in the house, and the disease, for the time, ceased in the town of Coimbatore. This town is kept in good order by the Municipal officers, who take a lively interest in all that relates to public health. I have made suggestions for some improvements that would tend to better the water-supply and conservancy of dwelling houses, and I am quite satisfied that the energetic President, H. E. Sullivan, Esq., will lose no opportunity of giving them effect. The old fort is the most unhealthy part of the town; the soil is saturated with nitrous earth, evidencing organic decay in past ages. The well waters of this portion of the town are abundantly charged with organic matter in a state of decay, and when cholera breaks out in the town it usually begins in the Fort.* The new

First case.

Other cases following in the same house.

Sanitary condition of Municipal town.

* In January 1871, cholera again broke out in this part of the town, and the first case occurred in the house next to the one I have described as the locality of the first fatal case in September.—(W. R. C.)

Immunity of the Central Jail.

Central Jail on higher ground, built on clean surface soil, and obtaining its water from wells sunk 40 or 50 feet in the rock, which water gave evidence of much purity as regards changeable organic matter, was unaffected by the cholera wave.

Water-supply.

126. And in regard to the connexion between water-supply and cholera, I may state here that no fact has come to my notice during these inquiries, which would indicate that cholera can spread amongst a people who consume a water practically free of organic particles in a state of decay. In all the instances of outbreaks I have investigated, there have been good grounds for believing that the water-supply was far from pure. This was the case in Fort Saint George, Perambore, Madura, Salem, and Coimbatore. Where the water-supply has been practically pure, I have not found that cholera affected the people using such water, although the disease may have been epidemic in the locality.

In making these observations I do not wish to commit myself to any theory as to water being the only, or the most general, medium of cholera communication. So far as I can judge, impure water is but one of the channels by which cholera may be ramified, though it is, no doubt, an important one.

THE NEILGHERRY HILLS.

Inquiry as to the fact of the Neilgherry Hills being exempted from cholera invasions.

127. In all the years since our occupation of the elevated plateau of the highest portion of the Western Ghauts, there is no record of a cholera wave affecting the resident population.

128. The hill tribes hold but little intercourse with the low country, but the European settlements have attracted a numerous semi-resident population of pariahs, and other classes from the plains, and a considerable traffic goes on between the Coimbatore District and the Neilgherries on one side, and the Mysore country on the other. The approaches to the hill stations by both roads are practicable for wheeled conveyances. With such an amount of traffic as there is between the hill stations and the low country, it may reasonably be thought that cholera would find its way occasionally to the cool and temperate region of the mountain plateau, and practically this is the case. As a portion of the general inquiry regarding cholera, I have thought it right to examine the records in the office of the Inspector-General, Indian Medical Department, from the epidemic invasion of Southern India in 1859, down to the present time, to see upon what basis of fact the often repeated assertion rests, that cholera is unknown on the Neilgherries. The facts, I believe, are of the same order as those noticed in regard to the Shervaroy Hills. The disease has been often imported by travellers, but there is nothing in the accumulated evidence to lead us to imagine that cholera has sprung up from an aerially conveyed "germ." The sanitary condition of the native bazaars at the hill stations has been, and still is, far from satisfactory, and the wonder is that cholera has not, on many occasions of importation, taken firm root in them. Practically it has not done so, except for a very limited period during the year 1866. In a matter of this kind, I shall appeal only to recorded testimony of the Medical Officers who have served tours of duty on the hills.

Particulars of cholera cases, seen on the hills.

129. Dr. G. Mackay in his paper on the "Climate of the Neilgherry Hills" (*Madras Medical Journal, volume III., p.* 13) summarizes his four years' experience of Ootacamund (1856-60) as follows:—

"A severe form of diarrhœa, which often proves fatal, is not uncommon among

the natives of Ootacamund, when the first showers of rain fall, previous to the setting in of the south-west monsoon, but I have only met with one case of undoubted cholera, in which the disease originated on these hills. This was a prisoner in the Ootacamund Jail, in whom the disease proved rapidly fatal. I have seen several other cases in persons (one a European) who had just arrived from the low country, and evidently brought the disease up with them. The climate does not seem to have the slightest effect in modifying the symptoms of this disease; on the contrary, the cases I have seen have been most severe and rapid."

130. There are two European settlements on the hills, which have large traffic with the plains. Coonoor, with an average altitude of under 6,000 feet, and Ootacamund, which is between 7 and 8,000 feet above sea level. A large amount of the traffic, between Ootacamund and the low country, passes through Coonoor; and with cholera raging on the Coimbatore side of the hills, Coonoor is liable to be first attacked by imported cholera. The third station "Kotagherry" has no Civil Hospital, and there are no records preserved, showing the presence or absence of cholera. "Wellington" is the depôt for European troops and invalids.

Civil Dispensary Reports.

1859. In the "Annual Report on Civil Dispensaries" for 1859, a year in which the Coimbatore country was not invaded by a new cholera, I find that there was no case of the disease seen at Coonoor, but a single case in Ootacamund, which is referred to by the medical officer in the following terms:—

"The case occurred in the month of March. The patient, a man who resides in Ootacamund, went down to Segoor (a village at the foot of the ghaut on the Mysore side) on some business; cholera was at the time raging there. The day after he returned to Ootacamund (22nd) he was attacked with the disease, and brought to hospital; on the 30th he was discharged cured.—(*Report on Civil Dispensaries*, 1859.)

1860. *Ootacamund.*—Dr. Mackay remarks:—"Two fatal cases of cholera are recorded; one was that of a prisoner who was attacked on the 8th February. *It is the only instance I have met with of this disease originating at Ootacamund.* The other fatal case was that of a man from Palghaut who had evidently contracted the disease on his journey. He was admitted with symptoms of cholera in a severe form, on the second day after his arrival at Ootacamund; he gradually sunk, and died the following day."—(*Report on Civil Dispensaries*, 1860, *p.* xl., *Appendix.*)

Coonoor.—Mr. Leslie of Coonoor makes no mention in his report of cholera in the station, and the Dispensary returns show that no cholera case was treated during this year.

1861. *Ootacamund.*—There were three admissions at the Civil Dispensary in 1861, one in May and the others in September. The medical officer records that "they arrived on the hills a day or two before choleraic symptoms appeared."

Coonoor.—The Dispensary returns note three cases—one in May and two in September; all fatal.

The only remark I can find about these deaths in the medical officer's report is as follows:—One patient was admitted under the head "cholera." "He was brought in a state of complete collapse very like that of cholera, but whether it was truly so, I cannot say; he died shortly after admission." I infer from the fact of the cases occurring at the same time of the year as those in Ootacamund, that the disease was brought up the Coonoor Ghaut.

1862. *Ootacamund.*—In 1862 there were, according to the returns, two admis-

sions in the Civil Dispensary. The Medical Officer remarks of one of them: "The case of cholera occurred in a policeman, who had just arrived from Coimbatore. I passed the man on the road at about 5 o'clock in the evening, as he was being carried by two other men. The men that brought him stated that he was much purged on the road, and that within a few miles of Ootacamund, he fell down, unable to stand."

Another case, a woman residing in the town, was admitted on 3rd August under the head "Cholera Biliosa." Of this case the Medical Officer records: "The case perhaps might have been termed one of enteritis, or peritonitis, rather than cholera biliosa." It is evident from the detailed account of the case, given in the annual report, that it ought never to have been classed with any form of cholera. An error of diagnosis was made, and the heading of the case was not changed, as it should have been.

Coonoor.—No admission from cholera. Station reported to be very healthy.

1863. *Coonoor.*—Five cases of cholera admitted in 1863. The Medical Officer, Dr. Colvin Smith, makes the following remarks:—

"The five cases of cholera occurred in a gang of convicts passing from Tinnevelly to Ootacamund. They were all attacked with the disease before leaving Metapolliam (the village at the foot of the ghaut, only 900 feet above sea level). Two were peons, the other three were convicts."

Ootacamund.—"Three cases of cholera were admitted; the disease in each case was evidently contracted in the plains."

1864. *Coonoor.*—The cases alluded to in the report of 1863 were admitted at the end of the year. In January 1864, five other cases were admitted. The Medical Officer observes, "they all occurred in persons who had just arrived from the low country, and who had brought the germs of the disease with them."

Ootacamund.—Two admissions and no death. The Dispensary report is silent as to the antecedents of the cases. Four deaths were reported to have occurred in the bazaar, but the Medical Officer did not see them, and there is no history of the individuals.

1865. *Coonoor.*—No cholera case was seen in 1865.

Ootacamund.—One death amongst the out-patients. "The case did not originate on the hills. The patient was a Mussulman, the son of a shop-keeper, and was attacked on the same night that he returned from Coimbatore."

1866. *Coonoor.*—The Medical Officer, Dr. G. S. W. Ogg, writes, "several cases of cholera occurred in the station during the year 1866. The disease can hardly be said to have prevailed in an epidemic form; but, as cholera has rarely if ever been known to spread when introduced into Coonoor from the low country, before this year, it may be well to take notice of the outbreak. The epidemic originated at a place called Kurmathanputty near Coimbatore, during the celebration of a Roman Catholic festival. Many natives had gone from the hills to be present at the festival, and on their return it was observed that the disease broke out at Goodalore and Metapolliam, and other places on their route.

"The first cases in Coonoor were found in every instance but one to have occurred in persons who had lately returned from Kurmathaputty, or from the low country, having passed through Goodalore or Metapolliam. Most of those persons were attacked on their way up the ghaut, or in the night after their arrival. The single exception occurred in a young man who was attacked immediately after his arrival from Kotagherry (a small hill station twelve miles distant), where he had come in contact with some travellers from the low country. The first case of cholera in Coonoor occurred on the 8th October,

and the last on the 24th October 1866. During this period eighteen persons were attacked, and of these eight recovered."

Ootaeamund.—Mr. Furnell, the Medical Officer, reports the extension of the October cholera at the Catholic festival in the plains, to Ootacamund, as follows:—

" During the month of October, a Roman Catholic festival takes place at Kurmathanputty near Coimbatore, and numbers of devotees from these hills and the surrounding districts flock to the spot. An epidemic of cholera it seems made its appearance amongst the crowd assembled, and the people composing it immediately fled to return home. Many people (*eight*) were brought into Ootacamund in doolies or muncheels suffering from cholera, and were seen by the Dresser and myself. Most of these recovered, and so rapidly that many entertained doubts whether they had been cholera cases at all. *However, the sister of one young man who had been brought in from the low country, and who had nursed the brother in his attack, from which he reeovercd, was seizcd with unmistakable eholera and expired. She had not been out of Ootaeamund. A neighbour also, a woman, and who had not been to the low country, was seized and died. Having thus shown its eommunieability the eholera stopped.* Since then there have been one or two cases, one notably in a horse-keeper of the Livery Stablekeeper here, but of whose history, as to whether he had been out of Ootacamund or not, I could obtain no reliable information. There were twelve cases and six deaths in the Civil Dispensary."

A boy in the Lawrence Asylum was attacked with cholera on the 9th December in this year, and recovered. There is nothing to show whether the lad had been out of the station or not before the attack. This was the last case of the outbreak in Ootacamund.

1867. *Coonoor.*—" No cholera in 1867."

Ootaeamund.—" No cholera."

1868. *Coonoor.*—" No cholera in 1868."

Ootaeamund.—" No cholera."

1869. *Coonoor.*—" No cholera in 1869."

Ootaeamund.—" No cholera."

1870. There was no case of cholera anywhere on the Hills in 1870.

131. These then are the facts in regard to cholera, of late years, on the Neilgherry Hills. For convenience, I exhibit them in the following tabular form :—

Table showing Cholera on the Neilgherry Hills from 1859 *to* 1870.

Years.	Ootacamund.				Coonoor.				European Troops, Wellington, Military Station.				Remarks.
	A.	D.	Imported	Not imported.	A.	D.	Imported.	Not imported.	A.	D.	Imported.	Not imported.	
1859 ...	1	...	1	...	...	...	...	...	2	...	2	...	
1860 ...	2	2	1	1?	...	...	...	...	2	...	2	...	
1861 ...	3	2	3	...	3	3	?	?*a*	1	1	1	...	*a.* No history.
1862 ...	2	1	1	1*b*	...	...	...	...	...	...	...	...	*b.* Case wrongly entered as cholera.
1863 ...	3	2	3		5	...	5	...	...	...	...	...	
1864 ...	2	...	?	?*c*	5	4	5	...	...	...	...	...	
1865 ...	1	1	1	...	...	...	...	...	...	...	...	...	*c.* No history.
1866 ...	13	6	10	3*d*	18	10	18	...	...	...	...	...	*d.* Two cases occurred in friends of the sick, of the third no history is recorded.
1867 ...	...	...	...	...	...	...	...	...	...	...	...	...	
1868 ...	...	...	...	...	...	...	...	...	...	...	...	...	
1869 ...	...	...	...	...	...	...	...	...	...	...	...	...	
1870 ...	...	...	...	...	...	...	...	...	...	...	...	...	

132. In all these twelve years the only really serious importation of cholera to the hills was due to the attack of a number of the Native Christian residents, who had visited the low country in 1866, and contracted cholera at a religious festival in the Coimbatore District. These people, returning to the hills in considerable numbers, brought up the contagium of the disease in such bulk as to be the cause of cholera in a few persons who had never left the hills. In only one case is there any history of cholera "originating" on the hills—the case of the prisoner in the Ootacamund Jail, alluded to by Dr. Mackay. In this case the only evidence of personal communication with the low country was the fact of the food and clothing used by the jail prisoners coming from the plains. A single case of this kind, in which the disease might possibly have been conveyed by the food or clothing, or in which the choleraic symptoms might have been due to other causes than malignant cholera, can be of no weight in an argument that cholera contagium is "air-conveyed," in the face of the strong testimony afforded by numerous other instances, that the disease appeared only in those who had been exposed to risk in the low country, or who had been in communication with affected persons.

Cholera may be regarded as an imported disease on the Neilgherries.

133. It is quite certain, I think, from the experience of 1866, that if the Neilgherry Hill stations were often visited by crowds of Hindu pilgrims, the locality would not escape cholera as it now does. The Hills owe their immunity, so far as it is possible to judge, to the fact that the air, soil, and water of this elevated region are not often subject to the reception of cholera contagium, and possibly, in some degree, to the circumstance, that the contagium received by importation from below, is incapable of surviving in the conditions of air, soil, and water peculiar to the hills.

The actual position of the lower street of the bazaar at Ootacamund, in regard to the lake, and the sub-soil water underlying the sites of the houses, is such that I should never be surprised to hear that an introduced cholera had temporarily taken up its abode there.

Improvements in the water-supply, drainage, and conservancy of the hill sanitaria are in progress, and with due attention to these, cholera may, I think, be always kept from extending in our Southern Hill Stations.

134. While all the facts point to the conclusion that cholera does not find a congenial home on the Neilgherry or Shervaroy Hills, I may here observe that genuine typhoid or enteric fever has been by no means uncommon in the former locality, and that within my own personal knowledge, during the last ten years there have been three distinct outbreaks of it at the stations of Wellington and Ootacamund.

Typhoid fever common at Neilgherry Stations.

CHOLERA IN THE MADRAS DISTRICT AND PRESIDENCY TOWN.

135. In the month of January 1870, cholera was still lingering about Madras and Conjeeveram Towns, and in a few villages of the district, but it gradually died out before April. In April there was an appearance of cholera amongst some of the Native Catholic Christians of Madras, who seem to have acquired the disease at the "Little Mount Feast,"

Little Mount festival.

where the Native Christians assemble. In reference to this feast it may be remarked that the people congregate largely in the dry bed of the Adyar river, and below the spot where the greater portion of the dirty linen of Madras is washed, and that the polluted water of the stream is drunk by the heated and thirsty visitors.

Deaths in Madras in April.

In April there were 48 deaths in the town of Madras, and only 16 in the adjoining district, with nearly double the population of the town. In May the district deaths were, in consequence of the Conjeeveram outbreak, largely in excess, in proportion to the town deaths, the numbers being 287 for the district, and 79 for the town. In this month of May the town of Madras had not felt the influence of the local outbreak amongst the Conjeeveram pilgrims, but in June the deaths in the town went up from 79 to 391, while the district deaths increased only from 287 to 551. The intensity of the outburst was attained, both in the town and district, early in June. Heavy rain fell on the 15th of that month and in some measure cooled the heated air, and brought moisture to the soil, but no increase of cholera followed the rainfall. The epidemic, in fact, began to decline slowly from the middle of June, and was pretty well at an end, both in the town and district, by the end of August. The rainfall of the south-west monsoon was unusually plentiful. There occurred during the whole year 861 deaths in the town and 1,394 in the district, which figures show per mille ratios to population of 1·91 and 1·80.

Intensity of outbreak fell both in town and district early in June.

Heavy rainfall in June. No increase of cholera followed.

It will be observed that there has been no great disparity, on this occasion, between the rates of cholera deaths in the town and district. At the end of the year the town and district were practically free of cholera.

Cessation of cholera at the end of the year.

136. It has already been noted that a very local outbreak of cholera occurred in the month of March in H. M.'s 45th Regiment, located in the Barracks of Fort St. George. At the time when this outbreak occurred, the town was particularly free of choleraic forms of disease. The circumstances were investigated so far as they could be at the time, and the following facts elicited. The Regiment did not suffer from cholera during the season when it prevailed generally in the town, in May and June.

Cholera in H. M.'s 45th Regiment, Fort Saint George.

137. The mortuary register of the first two weeks of January show only one death under the head of cholera in the Municipality of Madras. In the 3rd and 4th weeks, there appears to have been a slight accession of the disease, especially in the 8th Municipal District, distant three to four miles from the Fort, in which the European barracks are located. In the week ending 4th February, three deaths from cholera are registered as occurring in the first and second municipal districts, which include Black Town. On inquiry at the Native Infirmary attached to the Monegar Choultry, I found that about this time a few cases were being received into that institution. One case, that of a traveller from the Nellore District, was admitted on the 23rd January. A patient in hospital, for chronic local disease, was attacked on 28th. Another case was brought in from the town on 29th. Another patient in hospital was attacked on 30th. The last case was admitted from Black Town on 10th February.

Cholera in town and neighbourhood before the outbreak in Regiment.

In the week ending 11th February, five deaths were registered in Madras, two in Black town, two in Triplicane, and one in the 8th Division. The mean of cholera deaths of ten corresponding weeks of previous years was thirty-seven.

138. On the 10th February, a Sergeant of the 45th Regiment, a married man living in one of the rooms of the middle storey of the Artillery Family Barracks, was seized with cholera, and died in a few hours. He is described as being a delicate man in health, suffering habitually from offensive breath, so that his comrades spoke of him as being "rotten" in constitution. This man was attacked on the day when a case of cholera was admitted into the Monegar Choultry, about a mile and half north-west of the Fort.

First case in Fort, 10th February.

From the 12th to 18th February, five cholera deaths, out of a total of six in the whole town, are registered as occurring in the 1st Municipal District (near the Fort).

Cholera in Black Town.

From the 19th to 25th February, only one death was registered from cholera. This occurred in the 3rd District (away from the Fort). In the week ending 4th March, there was not a single death amongst the Native population of the town from cholera.

139. On the 1st March a heavy storm of rain fell over Madras (1·72 inches), and on the same day a young East Indian woman, from a 3rd storied barrack, was admitted to hospital with diarrhœa and vomiting. The case is reported to have been suspiciously like cholera; she recovered.

On the morning of the 2nd March, a married woman of the 45th Regiment occupying rooms on the third storey of a family barrack, two or three doors from the person alluded to above, was seized with cholera and died very rapidly the same day. She is said to have been a weakly woman, and to have returned from the bazaar (Black Town) on the previous day during a heavy shower of rain, in which she got drenched. On the 3rd March, a Private of the A. Company, inhabiting the *M.* barrack, was seized with malignant cholera. He recovered of the primary effects, but died of pneumonia on the 11th March. On the 4th March, *four* cases occurred, one in the lower barrack room north-east angle, known as the *K.* barrack, and *three* in the room above the *K.* barrack, known as the *D.* barrack. On the 5th March, another case occurred in the *D.* barrack. On the afternoon of 5th March, the rooms *D.* and *K.* were evacuated, the men, strength as per margin, being sent to the cholera camp at the Red Hills, under canvas. On the 8th March, just before an official inspection of barracks made by myself, Drs. Hadaway, and Elliott, accompanied by the Commanding and Medical Officers of the Regiment, a Colour Sergeant temporarily residing in No. 1 Pay Sergeant's quarters, centre of barracks on the ground floor, was attacked by symptoms of cholera. He died the same evening. This was the last case occurring in the barracks.

Outbreak in Fort, 2nd March.

Evacuations of rooms in barracks.

6 Officers, 180 men.

140. Of the men sent to the Red Hill camp, the following cases occurred:— One man (Lewis) was attacked on 6th March soon after arrival at the camp; he had been suffering from diarrhœa since the previous day. Another case happened on the 7th "choleraic diarrhœa." Three other cases occurred on the 9th, two of which died, and one recovered.

Cases in Camp at Red Hills.

Return showing the Number of Patients treated for Cholera and Choleraic Diarrhœa in the Detachment 45th Regiment from 6th to 19th March 1870, *Camp Red Hills (Station)*
20*th March* 1870.

Date.	Rank.	Name.	Disease.		Age.	Company.	Previous health.	Habits.	Period of Service in India.	Whether Married or Single.	Hour of Admission.	How long previously suffering from symptoms of disease.	Whence admitted.			Symptoms on admission.					Result.			Recovered and Date.	Remaining.	Remarks.
			Cholera.	Choleraic Diarrhœa.									Barrack No.	Hospital and cause of original admission.	Camp.	Vomiting of characteristic discharge.	Rice water stools.	Cramp.	Collapse.	Suppression of Urine.	Died. In stage of collapse.	Died. In stage of re-action.	Died. How long after admission.			
March 6th	Pte.	John Lewis... ...	yes.	...	33	F.	Good.	Temp.	$5\frac{4}{12}$	S.	11 A.M.	12 hours.	...	...	yes.	Vomiting characteristic.	yes.	yes.	...	yes.	...	...	...	March. 19th	...	This man's disease changed to general debility 19-3-70.
6th	,,	Francis Scalling ...	...	yes.	31	F.	Fair.	do.	$11\frac{2}{12}$	S.	7-30 P.M.	3 do.	...	...	yes.	Biilous.	...	...	...	...	...	...	...	19th	...	Discharged from Hospital, 19-3-70.
9th	,,	Jas. Bradbury ...	yes.	...	29	F.	Good.	do.	$5\frac{4}{12}$	S.	6-30 A.M.	2 do.	...	...	yes.	yes.	yes.	yes.	yes.	yes.	yes.	...	11-3-70	...	...	Died at 11-25 A.M.
9th	,,	Ch. Taylor	yes.	...	28	F.	do.	do.	$5\frac{4}{12}$	S.	6 A.M.	2 days.	...	...	yes.	yes.	yes.	yes.	...	yes.	...	...	...	19th	...	This man's disease changed to general *debility* 19-3-70.
9th	,,	J. Doyle	yes.	...	27	G.	Fair.	do.	$5\frac{4}{12}$	S.	1-30 A.M.	$2\frac{1}{2}$ hours.	...	...	yes.	yes.	yes.	yes.	yes.	yes.	yes.	...	11-3-70	...	...	Died 7-50 P.M.

141. It will be observed with reference to these cases that eight of them came out of the upstair barrack-room marked *D.*, and two from the room below it marked *K.*; of the remaining four cases, two were from married quarters, one from *M.* barrack, upstairs, and one from the Pay Sergeant's quarters (ground floor).

Localization of epidemic to D. and K. Barracks.

Dr. Wood, Assistant Surgeon, H. M.'s 45th Regiment, remarks of the cases occurring at the Red Hill Camp:—

"The first case at the Red Hills, that of Lewis, occurred on the forenoon of 6th March, the day after leaving Madras. He complained of weakness on the 5th, and is said to have had diarrhœa, apparently on the 4th, for which he took medicine. He was batman to Colour Sergeant Smith of F. Company, and in which company several cases had occurred up to the 5th, *and had been working hard amongst the kits of men of the company who had been taken ill.* Private Bradbury, seized with cholera on the 9th, had taken Lewis' place as batman. Colour Sergeant Smith (name not in above list) became affected with diarrhœa and vomiting, but these symptoms wore off under treatment. *He lived in the tent with Lewis and Bradbury.*"

H. M.'s 45th Regiment "S. F."

Return of the Cholera Cases which occurred in the men sent to the Red Hills.

Corps.	Regimental No.	Rank and Names.		Company.	Room occupied by Company in the Fort Saint George.	Range.	Age.	Service.	Admitted.	Died.	Remark.
Detachment 45th Regiment.	165	Pte.	James Bradbury.	F.	* Upstairs...	D.	29	5	9-3-70	11-3-70	Malignant cholera.
	874	,,	John Doyle ...	G.	Downstairs (* under the above.)	K.	25	7	9-3-70	11-3-70	Do.
	299	,,	John Lewis ...	F.	Upstairs ...	D.	38	11	6-3-70	Convalescent	Do.
		,,	Francis Scalling.	F.	Do. ...	D.	30	12	7-3-70	Do.	Choleraic diarrhœa.
	1,171	,,	Charles Taylor...	F.	Do. ...	D.	29	10	9-3-70	Do.	Malignant cholera.

H. M.'s 45th Regiment "S. F."

Return of the Cholera Cases which occurred in the men of the above Corps stationed at Fort Saint George, Madras.

Corps.	Regimental No.	Rank and Names.		Company.	Room occupied by the Company.	Range.	Age.	Service	Admitted.	Died.	Remarks.
45th Regiment S. F.	1,293	Pte.	John Roome ...	A.	Upstairs ...	M.	36	16	3-3-70	11-3-70	Malignant cholera Died of pneumonia
	689	,,	Joseph Wilkinson	G.	Downstairs.	K.	32	12	4-3-70	4-3-70	Malignant cholera
	877	,,	Henry Ayling ...	F.	Upstairs ...	D.	26	7	4-3-70	Convalescent	Do.
	1,577	,,	William Phillips...	F.	Do. ...	D.	31	12	4-3-70	6-3-70	Do.
	1,473	,,	Walter Smith ...	F.	Do. ...	D.	20	4	4-3-70	Convalescent,	Do.
	1,555	,,	Henry Rickwood.	F.	Do. ...	D.	21	3	5-3-70	Do.	Do.
	2,697	Color Segt.	John Stafford ...	C.	No. 1 Pay Sergeant's quarter downstairs.	Centre of Barracks	40	26	8-3-70	8-3-70	Do.

142. The weather at Madras previous to 2nd of March had been unusually windy and dusty. The wind blowing from north, or north by west, with a velocity of from 280 to 304 miles in the twenty-four hours. For some days the surf was so high that no communication could be held with shipping in the roads.* On the 28th February, the last

Conditions predisposing to outbreak. *General.*

* Note.—In connexion with this strong wind and dust from the north, it may be noted that cholera was occurring at Nellore, about 100 miles to the north, previous to, and at the date of, the outbreak in the Fort. There is no record of its presence between Nellore and Madras.

day of the high wind, 0·04 inches of rain fell. Ozone registered on the 28th, 7·0. On 1st March the velocity of the wind fell to 115 miles in the twenty-four hours, and the direction had changed to nearly due east. 1·72 inches of rain fell in the morning. A most unusual thing is the occurrence of rain in Madras in February, or early in the month of March. On the 2nd, 3rd, and 4th of March, the velocity of the wind had fallen to 92, 64, and 82 miles, respectively, in the twenty-four hours, the direction being north-east by east, or east by north. Ozone which had marked 7·0 on the 28th February fell as follows on the following days :—

Unusual rainfall.

1st March	4·5
2nd ,, ...	2·0
3rd ,, ...	3·8
4th ,, ...	3·0

143. The barrack-rooms were thought to be overcrowded at the date of the outbreak on the 2nd of March. From a statement appended, it will be seen that barracks D. and K., which yielded almost the whole of the cases, had actually less than their regulation complement of men. The D. barrack gives space for 64 men, and had only 59 in it; the K. barrack holds 64, but had only 56 inmates; the M. barrack, in which the first case occurring in barracks happened, was rather overcrowded at the time. It accommodated 62 men, and 67, or 5 beyond the regulation number, were sleeping in it the night before the outbreak. On the other hand the B. barrack, which has accommodation for 78 men only, although occupied by 101 men, had no case of cholera.

Local. **Overcrowding.**

Of nine barrack-rooms which had fewer men than the regulations allow, cholera occurred in two rooms, and the epidemic was chiefly confined to them. Of four rooms actually overcrowded, according to regulation, cholera occurred but in one, and in that case only a single person was attacked.

ACCOMMODATION AND CROWDING.

H. M.'s 45th Regiment.

Allotment and Occupation of Barracks on 1st March 1870.

Room or Range.	Cubic Feet Space.	Space in Superficial Area.	For what number of men allotted.	Number of men occupying.	Remarks.
A	50,653	3,307	36	28	
B	120,108	7,081	78	101	Overcrowded.
C	63,690	3,440	38	44	Do.
D	88,640	5,795	64	59	
E	89,773	5,721	67	68	Overcrowded.
F	12,200	784	8	8	
G	49,546	2,674	29	26	
H	64,584	4,905	54	37	
J	30,720	2,093	23	None.	Theatre.
K	58,952	5,818	64	56	
L	120,320	7,110	78	72	
M	77,647	5,580	62	67	Overcrowded, a case of
N	11,239	780	8	8	cholera occurred in
O	22,984	1,812	20	17	this barrack-room.
R	6,480	735	8	None.	Theatre.
		Total...	637	591	

144. As regards the influence of sleeping on the ground floor, or above the level of the earth, seven of the cases (including the case of 10th February and

Upper or lower stories.

the woman on 23rd March) came from up-stairs rooms, and two only from the ground floor. Of the five men attacked at the Red Hills four had come from the D. barracks upstairs.

Particular condition of barracks K. and D. disturbance of soil.

145. On inspecting the barracks K. and D. on their vacation, there was no insanitary condition evident to which the outbreak might fairly be attributed. In the ground floor, or K. barrack, the granite flooring had been lately disturbed, and a trench, about two feet deep, dug in the soil across the width of the barrack to lay a gas pipe, and the opening had been continued to the open courtyard in the square of the barrack, where the rainfall of the 1st March must have had access to, and wetted, the surface soil beneath the pavement. One of the men seized with cholera had his cot within a couple of yards of the open trench in the barrack floor, but, as by far the greater number of cases occurred amongst the occupants of the upper storey, it seems very doubtful whether this disturbance of the soil on the ground floor could be regarded as a possible cause of the outbreak. It could have had nothing to say to the first cases of the East Indian woman and soldier's wife who occupied the upper storey of a married quarter, more than 300 yards distant, and who were the first persons to be attacked. It is a fact, I understand, that old and unused drains underlie the buildings in the neighbourhood of the K. and D. barracks, but they are not shown in any plan of the Fort drainage.

Water-supply.

The water-supply of the K. and D. barrack-rooms is from the same source as all other barrack-rooms and public offices in the Fort, viz., the general reservoir which is filled by water from the Seven Wells. I could not ascertain that it had been subjected to any special pollution. The chemical analysis of the Fort water-supply, made some years ago, shows it to hold a large per-centage of organic matter and salt.* It has been reported as unsuitable for use, and on the completion of the new water-works, a better quality of water will be available.

* Total solids per gallon of filtered water 59 grains, 5·6 removeable by incineration. 0·28 oxidizable, 24·55 chlorides.

Drainage.

146. The Fort drains, and the main drain of the town which debouches into the sea a little to the north of the Fort, were no better and no worse than they generally are, at the time of the outbreak. Their condition is at all times most foul, and the emanations from them generally most offensive. The heavy storm of the previous day must have stirred up the deposits which occur in badly constructed drains after a long drought, and the Fort ditch must have received a considerable addition of fresh water from surface drainage. The actual condition of this Fort ditch, in a sanitary point of view, is most unsatisfactory. It receives most of the drainage of the Fort, in addition to the storm waters and washings of the laterite roads, and year after year, accumulations of silt and mud from these causes increase. The D. and K. barracks are nearer to the town drain than most of the rooms.

No extension to the population.

147. There does not appear to have been any extension of the outbreak to the native population, either in Madras or at the Red Hills. The cholera deaths in the native population of Madras, as registered from the month of March, are shown in the margin. The disease was much below its mean prevalence at this period of the year, and can hardly be said to have prevailed at all, except in sporadic form.

——	Date.	Case.
Chintradripettah ...	Feb. 29th	1
	March	
Triplicane	5th	1
Do.	11th	1
Poodoopaukum ...	15th	1

Native Troops in Madras.

148. Amongst the Native Corps in Madras, the cholera admissions were as follows during the epidemic prevalence in June.

35th Regiment N. I., Vepery.

35th Regiment N. I., in the Vepery lines. The first case was admitted on the 12th June, and last on the 17th June ; total eleven cases, all of whom were Sepoys' relatives, of the number six died, and five recovered. No sepoy was attacked.

17th, Perambore.

149. 17th Regiment N. I. at Perambore. The first case occurred on the 5th June, and the last case on the 4th July; total thirty-eight cases, including all camp followers, of which fifteen died, and twenty-three recovered. The Commanding Officer of the Corps died of cholera on the 28th June. He resided near the Left Wing Barracks, where the disease first broke out and prevailed in its greatest intensity. Of the total admissions, seven were sepoys of the Regiment, and four deaths occurred amongst them.

Impure water-supply.

150. The lines of this Regiment were found to be very clean on inspection, but the huts were overcrowded, and defective in ventilation. As regards the condition of the water-supply used by the Corps during the prevalence of cholera, the following Report of the Chemical Examiner will testify in some degree to the fact of its great impurity. With such a water the wonder is, not that cholera should occasionally prevail, but that it is ever absent. The tanks had only recently been filled by rain water, the surface drainage of the whole neighbourhood, which is densely populated, and usually very filthy.

Analysis of Water at Perambore.

———		Mess-house Tank.	Right Wing Tank.	Left Wing Tank.
Appearance ...		Muddy, opalescent after week's subsidence.	Yellow or yellowish brown.	Turbid.
Taste ...		Earthy.	None.	Of sulphuretted hydrogen.
Odour ...		Do.	Do.	Do.
Reaction to test paper ...		Faintly acid.	Alkaline.	Acid soon becoming alkaline.
Solid matter in an Imperial gallon.	Organic and other volatile matters ...	9	11	10
	Inorganic ...	12	63	21
Total...		21	74	31
		OXYGEN.		
Organic matter (Dr. Angus Smith's method.)	Putrid ...	0·05250	0·15750	0·28000
	Decaying rapidly ...	0·14000	0·28000	0·49000
	After 24 hours.	2·80000	7·00000	9·80000

Ammonia was estimated after Messrs. Wanklyn and Chapman's method as follows :—

In M. grm. per litre.

Free ...	0·02	0·00	0·44
Albuminoid ...	0·32	0·48	0 39

Remarks.—None of these waters are fit for use. If one *must* be used, it should be the first after careful filtration.

I may note here that the Mess-house tank water, which is said to be the purest, was the only source of supply *not* open to the Sepoys. It had been found by experience that this water was so largely productive of guinea-worm in those

using it, that a Sepoy guard had been placed over the well and tank to prevent the men taking water from this source. Of the total number of thirty-eight cholera cases in the lines, twenty-five of the sufferers were living in or near to the Left Wing Barracks, and got their main water-supply from the most impure source. The intensity of the cholera prevalence and greatest impurity of water did certainly, in this case, go together, though the supplies of the Right and Left Wings were both so bad as to be sources of great danger. The 3rd Regiment N. I. at Royapooram in new lines, and with a fair water-supply, had no case of cholera.

Poonamallee, Saint Thomas' Mount, Palaveram.

151. The cholera-stricken pilgrims returning from Conjeeveram by road to Madras, through Poonamallee, appear to have infected that station slightly. In the cantonment death register, it appears that three deaths occurred from cholera in the month of May. There was no cholera during the year at Palaveram or St. Thomas' Mount.

THE EXEMPTED DISTRICTS OF 1870.

Central Provinces and Hyderabad.

152. Judging by the Military Returns, there was no general reproduction of cholera over the Central Provinces, and Hyderabad country in 1870. From Dr. Barclay, Deputy Inspector General H. S. Force, I learn that the only cholera in the entire district, occurred at Hingolee, and here the reproduction was very local. A single case occurred amongst the European troops at Secunderabad. The Southern Collectorates of the Bombay Presidency must, I imagine, from the parallel history of former epidemics, have enjoyed a similar exemption.

Bellary, Kurnool.

153. The districts of Bellary and Kurnool, which it will be remembered were the first to suffer from the invading cholera of 1869, remained wholly unaffected in 1870. There was one case treated in the Native Army at Bellary, which recovered, and a case resembling cholera was seen at Adoni, but the death returns of the two districts, embracing a population of 2,075,801, are silent on the subject of cholera.

The blank spaces in the following table are very remarkable. They illustrate, I think, one of the laws of cholera movement, viz., that cholera prefers to pass on to new ground, rather than linger in the localities already invaded, supposing there may be new or unoccupied ground in front of its line of advance;—

Cholera in 1870.

—	Population.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Bellary...	1,304,944	...	...	...	...	...	...	...	...	...	...	...	...
Kurnool	770,857	...	...	...	...	...	...	...	...	...	...	...	...
Cuddapah	1,144,759	...	...	...	...	31	51	29	10	8	6	...	...

I infer that the cholera which passed over Hyderabad, Bellary, and Kurnool Districts in 1869 must have been weak, as it left no material behind for reproduction in the next year. The length of time occupied in the movement from Hyderabad to Tinnevelly is also, I think, an additional proof of weakly vitality in the new cholera contagium of 1869. If my inference is a correct one, the present and early part of the next year should see the final extinction of this particular epidemic wave, unless it should acquire new strength this year in the Western Coast Districts.

Cuddapah.

154. The Cuddapah District was nearly, though not quite, exempt from cholera in 1870. It felt the influence of the Tripatty outbreak in May, especially the talooks near to Tripatty.

Liability of Ceded Districts to cholera invasion.

155. The "Ceded Districts" of Bellary, Kurnool, and Cuddapah have been supposed to contain something in their soil peculiarly attractive of cholera, and I have lately made a tour through them with the view of examining into the subject. As a matter of fact, cholera is absent for longer periods together in these than in any other of the Southern districts. From their geographical contiguity to Bombay and Hyderabad, they are the first to suffer, when the epidemic wave from the north is in movement, and during a year of invasion, or a year following invasion, these districts have been known to feel the cholera influence most severely. But cholera has evidently no resting place in the Ceded Districts. It dies out over the whole tract of country for long periods together, just as completely as it does in any province of Europe or America. When it does come, it is peculiarly virulent, and prevails with greatest severity in the months of May, June, July, August, and September.

Cotton plains.

156. The great cotton plains of the Bellary and Kurnool Districts are a remarkable feature in the appearance of the country. The black cotton soil districts are but thinly inhabited, the population of Bellary being no more than 114 to the square mile. For miles on either side of the North-West Railway Line, hardly a tree or village is to be seen. The surface of the ground is gently undulating, and the black soil, which is continuous over great areas, varies in depth from 1 to 10, or 15 feet. It rests upon decomposing gneiss or granite, the felspar of which has decomposed into an impure kaolin. The granitic and gneissoid rocks of this district, which underlie the decomposing material just adverted to, are of very fine colour and texture, admirably adapted for solid masonry, for which purpose they have been largely worked by the railway engineers along the North-West Line.

Cotton soil.

157. The black cotton surface soil of these dreary undulating plains has long been a puzzle to geologists. Some have started a theory that it results from the decomposition of trap or igneous rocks, but, as regards the Bellary, Kurnool, and Cuddapah Districts, this is simply impossible, for in these localities trap dykes are so few and far between that their decomposition could certainly never have covered the face of the country with the thickness of black soil we now see upon it. I reserve for a future occasion a description of the microscopical and chemical features of this soil, and shall only allude now to some of its physical characteristics. In colour the soil is a dull bluish black, not so cohesive when dry as some brown clays, and containing particles of silica and occasional granules of decomposing feltspar. After heavy rain the surface of the black soil fills like a sponge, and it is quite impossssible to walk or ride upon it, without sinking deep into its adhesive surface. In dry weather the soil contracts, and large fissures open out in it, many of them to a great depth. At the dry season of the year only is the surface passable for men and animals. The black soil does not shade off imperceptibily into the decomposed rock surface beneath. The division is generally very sharply defined, and the contrast between the black surface soil, and the white or reddish kaolin earth beneath, most remarkable. The black soil is evidently a sub-aqueous or sub-aerial deposit, such as might have formed at the bottom of a fresh water lake or swamp,

and possibly the colour may have resulted from old vegetable organic forms, long since obliterated. At present the soil does not appear to be noticeable for any organic forms.

158. In the rainy months the black soil is retentive of moisture. It seems doubtful, however, whether it fills with water to any great depth below the surface. I am informed that in the construction of bridges, more water-way has to be allowed in the districts where this soil occurs than elsewhere, and the inference drawn from the fact by the Railway Engineers is, that the soil does not readily absorb water. I am not quite sure, however, that this is really the fact. The average depth of the cotton soil is between two and four feet, and below the soil there is practically no absorbing medium, for solid rock (the surface only disintegrating) lies immediately under the soil. My impression is that in the rainy season, the black cotton soil at average depths is saturated with moisture, and that the cause of the heavy floods after unusual rain is that the rock underneath the black cotton soil is practically non-absorbent. When the surface soil is saturated, the excess of water must be discharged in floods.

Prevalence of Malaria during desiccation of soil.

159. The drying up of the soil after the seasonal rains is a slow process, and the period of the year in which it occurs is always marked by an accession of malarious fevers. Since 1866, a year of heavier rain-fall than ordinary, there has been an excessive development of fever in the Ceded Districts. The mortality from fever however began to diminish in 1870. The people of the cotton soil districts suffer a good deal from fever in the cold weather; guinea-worm is a common disease, and occasionally the "fungus disease" of the foot, (of Carter) is seen in the Bellary and Cuddapah Districts.

Water-supply of cotton soil districts.

160. The potable water of the district generally is precarious in quantity, and much of it probably of doubtful quality. The wells sunk in rock, or decomposed rock, often fail in the dry weather, and the water obtained from them is hard, though tolerably free of organic constituents. During and after the rainy season much water of the surface drainage falls into shallow pools and tanks, which are a good deal resorted to by the poorer people; and judging from the appearance and taste of such water, it must often be very unfitted for use. These surface waters, as they begin to evaporate, leave a residue of saline inflorescence, carbonates of soda, magnesia, and chloride of sodium,* while they all hold alumina in suspension. The water of a new well at the Railway Station, Raichore, sunk in decaying granite, was found to be particularly free of putrescent organic matter, and an examination of specimens of water at Ghooty and Bellary, showed that the well water was generally free of organic matter. The use of the impure surface water of the district is doubtless objectionable, though from the scattered populations of the villages which have wells, the labour and expense of well-sinking, and the custom of natives to drink from the nearest source, it is very difficult to see how the use of such water can be prevented. It is quite easy to understand how, in cholera seasons, the surface collections of water may become dangerously fouled, so as to aid in the dissemination of the disease.

Agriculture.

161. The culture of the cotton plains is very general. Indeed, it becomes a source of wonderment in journeying through the country, where the people come from who till the lands. The traveller may proceed for miles without coming upon a village, but all the land, where

* Until recently, earth salt was made from certain tracts of soil of the Bellary District.—(W. R. C.)

there is any soil to cultivate, is planted either with cholum or cotton. The crops are generally thin and scanty, and this is scarcely to be wondered at when it is considered that the mere surface soil is scratched by the native plough, and that deep ploughing and manuring of the fields, except in the neighbourhood of villages, is unknown.

District destitute of trees.

162. A marked feature of the Bellary country is the absence of trees. It is not that trees decline to grow in the cotton soil, for the *Babool* (acacia) flourishes naturally in it, if allowed, and the *Neem* (margosa) and tamarind grow freely enough by the road sides, where they were planted by Sir Thomas Munro, and the various officials who succeeded him in the administration of the province.

Treeless districts very liable to cholera.

163. With the exception of the immediate neighbourhood of village sites and public roads, there is hardly a tree to be seen between Ghooty and Adoni, or Ghooty and Bellary. It has been observed, as a matter of fact, of similar treeless districts in the Central Provinces, that they suffer more during cholera invasion than a well wooded country, and possibly the ill-repute of the Ceded Districts for cholera in times past may have arisen, in some degree, from this peculiar feature of the country. The influence of trees in the destruction of unwholesome miasmata is well known. On economical as well as sanitary grounds, it is most desirable that tree-planting should be encouraged throughout the districts of Bellary, Kurnool, and Cuddapah, in situations where they do not at present exist, and where there may be reasonable prospects of successful cultivation. Any means by which the cultivators can be got to see that their health and pecuniary profit are concerned in the growth of trees, might with advantage be adopted. Whether it be practicable to compel ryots to plant a definite number of trees in proportion to their holdings, as a condition of the tenure of the land, or to encourage planting operations in other ways, are matters for the decision of Government. It is my duty to point out that the comparatively treeless character of the districts, besides affecting the climate, may, and probably does, favour the intensity and general distribution of cholera during the seasons of its prevalence.

Black cotton soil does not harbour the contagium of cholera.

164. But it is, I think, satisfactorily shown that there is nothing *per se* in the black cotton soil of the Ceded Districts that harbours cholera, or that favours its reproduction.

In the Ceded Districts, as in Bundlecund and Nagpore, where the same description of soil occurs, cholera dies out completely after an invasion, generally in the early years of the interval between two invasions, while in the alluvial soils of our river deltas to the south, and even in some rocky soils, the process of cholera decay is always slow and frequently delayed, so as in some instances to occupy the whole interval of years between two successive invasions.

CHOLERA IN MYSORE, 1870.

165. For the following notice of the extension of the epidemic over a portion of the Mysore plateau, I am indebted to Deputy Inspector General of Hospital J. L. Ranking, who supervises the Civil medical administration of the Mysore Province.

Extract from Annual Abstract Report (*Military*) *to the Inspector-General, Indian Medical Department*, *for* 1870.

* * * *

Slight prevalence of epidemic disease.

"As regards epidemic disease and noteably cholera, although it has not been entirely absent, its prevalence has been moderate. In the province of Mysore, it at one time threatened to become epidemic. Indeed, a sufficient number of deaths occurred in the cantonment of Bangalore itself amongst the civil community, to awaken fear that a widespread epidemic might be impending. The disease first made its appearance in the month of April in the village of Chumbanhully, in the district of Bangalore, on the eastern frontier of the province. (I should here remark that, on my assuming charge of my duties on the 1st of April, I put myself in communication with the Chief Commissioner, requesting that I might be put in possession, through such agency as he might think best, of a daily return of deaths by cholera throughout the province, and that I from that period received from Superintendents of Districts reports of every death. The first death reported under the order issued by the Chief Commissioner was on the 25th April, but I cannot say that this was the *first death of the year*, as prior to April no returns of this nature were rendered to my Office). During April ten deaths were returned from the talook of Sarjapura. On the 19th May a death was reported in the town of Colar, in the Bangalore District, and three in two villages close to Colar. The disease continued to spread in the village of Chumbanhully, eleven deaths being recorded up to the 11th of May. On the latter date three deaths were also returned from the Hurryhur Talook, in the Chittledroog District, quite at the opposite extreme of the province. On the 25th three deaths were reported at Kingherry and Chennapatam Villages, on the high road from Mysore to Bangalore.

Bangalore District.

Bangalore Cantonment.

"Towards the end of the month, the disease acquired a wider prevalence, but was confined principally to the Bangalore and Colar Districts. Seventy-five deaths in all were reported. On the 30th the first death occurred in the cantonment of Bangalore. No other deaths were reported till the 8th June, when one occurred, and another on the 10th. On the 11th one was reported in the lines of the 27th Regiment Native Infantry. On the 14th one in the town, and on the 16th two in the Bowring Civil Hospital. On the 23rd and 24th two other deaths occurred in the bazaar. During this same period the disease was slowly extending throughout the province. In this month (June), 114 deaths were reported. In July the disease acquired a still wider prevalence, the deaths amounting to 122, the southern and eastern districts being principally, indeed almost exclusively, affected. In August the deaths fell to eighty-one; in September to forty-four; in October to forty-three; and in November to forty-three. By the end of this month the disease died out, no deaths being reported in December.

Investigation of early cases at Bangalore.

"I need not say that I used every endeavour to trace the origin of the first cases that occurred in the cantonment of Bangalore. Dr. Young, the Garrison Surgeon, also gave his attention to the subject, but was 'not able to get any reliable information regarding the first cases that occurred.' The fact is, the first deaths occurred some days before they were reported, and the opportunity was lost of ascertaining the exact conditions under which they originated, as must be always the case, unless the

information be obtained from the patients themselves, or from members of their family at the time. It will be observed that six cases and four deaths occurred amongst the Native Troops, five cases with four deaths in the Corps of Sappers and Miners, and one case, which also died, in the 27th Regiment Native Infantry. Other cases occurred amongst the families of the Sappers and Miners. Neither did the diseases altogether spare the European Troops. Some cases occurred amongst the men and families, but I have no knowledge of the circumstances attending the origin of these cases, as, under the condition of separation of the two Services, British and Indian, I received no report of them, nor did it fall within my province to inquire into them.*

"In regard to the vexed question of propagation of the disease by human intercourse, or by prevailing currents of wind, as advanced by Dr. Bryden, I may remark that the progress of the pestilence through the province was from east to west, and that the prevailing winds from May to October are westerly, moist, and travel at a high velocity. But it is by no means easy to determine the precise course the disease followed. It is not clear by what route the disease entered the province. The first death was reported from the Sarjapura Talook, on the 25th April. This talook borders the high road to Salem, and a cross road leads from the Salem high road through Sarjapura to Maloor and Colar, at the Cusbah town; of which latter talook the next death (May 19th) is heard of. From this date, which the Superintendent of the Nundidroog Division considers to be the date of the first death in that division (he apparently had not been apprised of the deaths in April, ten in number, in the Sarjapura Talook) the disease began to extend in different directions and to places wide apart. Thus, on the 24th, a death occurred at Maloor; on the 25th deaths were reported from Mundium, Chennapatam, and Kingherry Towns to the south-west of Bangalore on the high road to Mysore; on the 27th from Mulwagul, the adjoining talook to Colar; on the 29th in the Bangalore Talook; on the 31st in the Hoskote Talook to the north-east of Bangalore.

"From this period the disease established itself in Bangalore, and did not die out in the talook till the 28th of September. Within this period deaths were being reported from various parts of the province, and rather later, in October and November, it extended to the talooks of Periapatam, Narasipura, Manjarabad, and Maharajandurga, a steady movement in a westerly direction, the prevailing winds at Bangalore being S. S. E. and E. S. E., veering to the N. E. But quite in the opposite direction, viz., in the talook of Mulwagul, on the extreme end of the province, a rather sharp outbreak occurred on the 5th November. The last death reported was on the 28th November in the Manjarabad Talook.

"The disease, in fact, moved so capriciously, that it is impossible to say whether it was propagated along the main lines of intercommunication, or by prevailing winds. The earlier cases certainly appeared to occur in towns situated upon the main roads. Later in the year, however, it appeared to extend in the direction of the prevailing currents of air, though it overleapt several talooks in its way to the western talooks of Narasipura, Maharajadurga, and Manjarabad. The extension to Mulwagul, on the 5th November, was again in the very teeth of the prevailing wind. It was only at Bangalore

* Amongst the European Troops at the station, there were seven men and four women attacked. Five of the former and three of the latter died.—(W. R. C.)

itself and at Mulwagul and Chumbanhully that the disease assumed epidemic characters. In other talooks the deaths were few, and often at long intervals.

* * * *

"The shading of the map* shows that the disease was confined almost entirely to the eastern or south-eastern talooks of the Nandidroog Division, a few ripples of the storm wave only reaching some of the northern talooks, and a gap existing between this region and the western talooks of Narasipura, Maharajadurga, and Manjarabad. Hurryhur on the north-western frontier and Budihulli on the south of the Chittledroog District stand out by themselves, isolated from the rest of the northern tracts of the province.

"The fact is, that in all the talooks with mortality not exceeding three in 10,000 inhabitants, the cases which occurred were sporadic.

"It is impossible to say whether the disease reached Bangalore from the westward or eastward, seeing that it prevailed on both sides of it. At the close of 1869 cholera prevailed in many parts of the Madras Presidency, noteably in North Arcot, Nellore, and the Madras Districts, and at the beginning of 1870, it prevailed in Tanjore and Trichinopoly. It also "lingered on"—as is stated by the writer of the article "Cholera in 1870" in the Madras Medical Journal—"in the Zemindary tracts of North Arcot, and in that *terra incognita* Tripatty; it prevailed also slightly in Nellore * * * But in Tripatty a great congregation of pilgrims assembled in the beginning of May, and suddenly we hear of epidemic cholera not only in the town of Tripatty, but along various routes taken by pilgrims. The great feast of Conjeeveram began on the 11th May, and many of the Tripatty pilgrims went thither direct by rail. As might have been anticipated, cholera broke out at Conjeeveram at the same time, and the people in dispersing, scattered it all over the southern portion of the North Arcot District, Madras, and the eastern portion of the Salem District. From North Arcot, and possibly by means of the Tripatty pilgrims, cholera spread over the Mysore plateau.

"Now I have shown that deaths by cholera had been reported in the districts of the Nandidroog Division of the Mysore Province as early as April, prior, that is, to the Tripatty and Conjeeveram feasts.† It is true that the disease did not acquire any widespread prevalence till a period subsequent to those feasts. The first death occurred at Bangalore itself on the 30th May, though it was not till July that the disease prevailed to any extent.

† I am inclined to think that cholera had not quite died out in the eastern districts of Mysore since the slight invasion in 1869.—(W. R. C.)

"If then it was imported, as I am disposed to hold it was, it was at a period antecedent to the Tripatty and Conjeeveram festivals, though a fresh importation may have occurred at a later period, and account for the outbreak in the cantonment in July. The Garrison Surgeon writes, 'very strong evidence is afforded that it was introduced by some of the numerous travellers passing through the station, or the pilgrims who had been attending feasts held in the affected districts.' Although I am disposed to hold that the disease was thus imported, I do not think that '*the evidence*' is sufficiently strong to justify its being asserted as a fact, as the mode of origin of the first cases reported could not be satisfactorily traced.

* Dr. Ranking's figured map of Cholera in Mysore, has been included in the general Cholera map for 1870, accompanying this report.—(W. R. C.)

"The map I have prepared shows the incidence of the disease in the several districts of the province upon the plan adopted by the Sanitary Commissioner in his last Annual Report, the comparative prevalence being indicated both by deepening shades of colour and by figures giving the mortuary rates per 10,000 of the estimated population; exhibited in figures, the following are the results :—

Statistics of Cholera in Mysore.

Estimated population of province	4,106,762
Total deaths reported in 1870	525
Death rate per 10,000 of population	1·28

"In the different divisions the results are as follow :—

Nandidroog Division ..	Population	1,680,083
	Deaths	444
	Ratio per 10,000	2·64
Astagram Division ...	Population	1,330,495
	Deaths	65
	Ratio per 10,000	0·49
Nagur Division ...	Population	1,070,421
	Deaths	16
	Ratio per 10,000	0·15

"The ratio of mortality for the whole province is so low, that the disease can scarcely be said to have manifested any epidemic virulence. The Nandidroog Division, the most eastern of the province, suffered most. This division comprises the three districts of Bangalore, Colar, and Toomkoor. Of the 444 recorded deaths, 286 occurred in the Bangalore District, of which 133 pertain to the town of Bangalore itself, viz., 116 to the cantonment, and 17 to the pettah. In the Colar District, there were 155 deaths, and in Toomkoor only 3. The mortuary rates per 10,000 inhabitants in these districts are Bangalore 4·33, Colar 2·92, and Toomkoor 0·06. In the cantonment of Bangalore, the mortality amongst the population, estimated at 79,301, is 14·6 per 10,000, while in the pettah, with its 52,895 inhabitants, it was only 3·2 per 10,000. In 1869 the results were just the reverse, the incidence of the disease having been experienced most severely in the pettah, while the cantonment was almost spared.

"This was at the time attributed to the more energetic action that was taken by the cantonment than by the Pettah Municipal authorities, but in 1870 the same precautionary measures were taken and carried out with equal energy. I do not attempt to reason upon these facts, I merely state them.

"In regard to the adoption of measures calculated to arrest the progress of the disease, I may state that, on assuming the duties of my office, I placed myself in communication with the Chief Commissioner of the province, and suggested the adoption of the sanitary measures in force in the Madras Presidency, for the supervision of agglomerations of the people at fairs and festivals throughout the province. Effect was at once given to my suggestion; measures were also taken to put parties of travellers, amongst whom cholera might prevail, in temporary quarantine, by staying their progress, and separating the sick and treating them on the spot where medical aid was available. Rules for disinfection of houses and personal effects were also drawn up, published in the Vernacular, and widely circulated.

Sanitary precautions taken.

"At Bangalore itself a cholera hospital was established at the outskirts of the

Cholera Hospital at Bangalore.

station. Medical subordinates were placed at the disposal of the Municipality, under the order of the Garrison Surgeon, for house-to-house visitation in the bazaars, and the disinfection of houses was carried out through a special sanitary agency entertained by the Municipality. All suggestions were immediately acted upon and vigorously carried out."

CHOLERA AT THAYETMYO, BRITISH BURMAH.

166. It does not fall within my province to give an account of the distribution of cholera in British Burmah. The Sanitary Commissioner of that locality will doubtless detail the facts in his annual report. I have only here to note that there was a reproduction of cholera in April 1870 at Thayetmyo, and that a lamentable mortality occurred from it in Her Majesty's 76th Regiment and Royal Artillery. The particulars, in regard to the epidemic invasion of the Irrawaddy valley in 1869, are admirably described by Dr. Thompson, Her Majesty's 76th Regiment, in the Appendix to my cholera report for that year.

Outbreak at Thayetmyo on 3rd April amongst camp-followers.

167. The outbreak of 1870 began, so far as the European Troops were concerned, on the 7th April, but two cases occurred amongst the native followers of the Regiment (one in the "cooly lines," where the first case of the 1869 invasion occurred,) and the other in the "Sudder Bazaar" on the night of the 3rd April.

European Troops attacked on the 7th.

On the morning of the 7th of April, cases of cholera occurred in the barracks and hospital of the 76th Regiment and in a Royal Artillery barrack; in the former among the Band and Drummers, and B., G., and L. Companies. On this first day of outbreak seven cases came under observation.

Removal to camp of affected troops.

168. The first step taken on the occurrence of cholera was to march out the affected companies to camp. On the 8th April, the Band and Drummers were moved to the Brigade parade-ground, and on subsequent dates, 9th, 10th, and 11th April, respectively, the B., G., and L. Companies were also marched out to the site chosen for a cholera encampment. On the 13th the Band and Drummers were shifted from their camp on the parade-ground to this site. A distinct hospital establishment was provided for each company. On the 8th of April a second patient in hospital, in Thayetmyo, was attacked by cholera, and shortly afterwards the wife of the Hospital Sergeant who resided in the building. During the night of the 8th April, the wife of a Corporal, residing in No. 10 Family Barracks was attacked, also two privates in the G. and L. Companies, respectively.

Patients in hospital attacked.

On the morning of the 9th, another man of the L. Company was seized, and in the afternoon one of the G. Company. No fresh case occurred until the afternoon of the 12th, when a man of the E. Company was attacked.

Appearance of cholera in the camp on the 13th April.

169. On the afternoon of the 13th April, the first case occurred in the men moved out to the cholera camp, and from that date up to the 19th no less than fourteen new attacks took place, of which number twelve died. These cases occurred principally in the L. Company. On the 15th April seven men of this particular company were attacked, and only one survived.

On the appearance of the first case in the cholera camp near the cantonment

Removal of camp to opposite back of the river Irrawady.

on the 13th instant, the local Military and Medical authorities arranged for the movement of the troops to the opposite bank of the river. An elevated site was chosen, and on the 16th, 19th, and 20th April, respectively, the B., G., and L. Companies, and the Band and Drummers were sent across the river and encamped on this ground. No cases occurred in the new camp until the 20th, when a man of the G. Company (which had crossed the river the day before) was seized and died very rapidly. Several cases of "diarrhœa" were reported also in all the companies.

Prevalence of diarrhœa both in camp and barracks.

170. During all these days no cases of cholera occurred amongst the troops remaining in barracks, but Dr. Thompson reports that there was a good deal of diarrhœa and much debility, especially amongst women and children. The Battery of Artillery had only a single case of cholera on the 7th instant, cholera prevailed to some slight extent amongst the natives of the cantonment.

Fresh cases in barracks on 20th April.

171. On the night of the 20th April two children were attacked in No 12 Family Barracks in Thayetmyo. The rooms were immediately evacuated and purified. No further case in the cantonment occurred on this occasion. About the end of May, after the return of the affected troops to cantonment, there was another outbreak, confined chiefly on this occasion to the Royal Artillery which had furnished only a single case during the epidemic intensity in the 76th Regiment.

Cessation of epidemic in camp on 21st April.

172. On the afternoon of the 21st April, the Roman Catholic Chaplain, who had been indefatigable in his attendance on the sick in the hospital camps, was seized with cholera and died on the 23rd. This was the last case connected with the camp. On the 2nd May the men returned to their barracks in Thayetmyo.

173. The general health of the Regiment appears to have undergone a great deterioration during the presence of choleraic influences in the station.

For some weeks subsequently, notwithstanding all that was done for their comfort, the men suffered greatly from the depressing influences that had surrounded them.

Report of the Principal Medl. Officer on the health of the Regt.

The Principal Medical Officer, British Burmah, inspected the Regiment on the 13th June, when he found a large number of sick in hospital and a still larger number unfitted for duty.

He remarks:—"I satisfied myself that the health of the Regiment was unquestionably bad. The symptoms from which the men suffer are extreme debility, with pains in the back and limbs; a small weak quick pulse; a white flabby tongue, marked distaste for food, and in some instances slight diarrhœa, with a general feeling of malaise; there is tendency to syncope and giddiness; the countenance is anxious; the eyes hollow and dark around their orbits; and the face suffused with pallor, and a general expression denoting debility.

To such an extent were the symptoms and signs of weakness present, and so long had these men been attending hospital without the least amelioration of their condition, that I considered it necessary to select fifty-four of their number for change, with a conviction that they would not regain their health at Thayetmyo."

174. While the 76th Regiment was suffering from these symptoms, indicative of feeble vital power, and probably also of very general cholera poisoning, the Principal Medical Officer notes that the men of the Royal Artillery stationed in the same cantonment were in excellent health and spirits. Yet this circumstance had not exempted the men of the Royal Artillery from cholera during the second outbreak in the station. He thought that mental dejection had something to say to the symptoms. No sanitary defect in the barracks or their conservancy was brought to light; but, in point of fact, the locality on which the European Barracks are built, has proved itself to be a spot in which cholera will always seek its victims. It is possible that the intense heat of the weather, and the exposure of the men in tents, at the most trying period of the year, might have accounted for some of the debility and languor prevailing after the cessation of cholera. The men are reported to have been sober and very well-behaved during the progress of the outbreak.

Exemption of the Royal Artillery from the debility.

Site of Thayetmyo Barracks liable to cholera outbreaks.

175. In 1859 (the year of a new outburst of cholera from the endemic area) the troops of this cantonment suffered. In 1863, when another epidemic wave started out of Bengal, Her Majesty's 3-60th Rifles, then stationed at Thayetmyo, suffered very severely. The epidemic advance of cholera in 1868 was also felt at Thayetmyo, for one man died in that year, but early in April 1869, the European Barracks near the river were struck heavily by cholera, and in 1870, it is clear, from the various reports, that the disease had not become extinct in the country, and that the outbreak at Thayetmyo was a violent reproduction, or revival, of a localised cholera. Knowing as we now do that cholera prefers low ground, and the immediate neighbourhood of the valleys of large rivers for its ravages, it is no longer a matter of surprise that Thayetmyo should suffer on the occasion of an epidemic invasion. With reference to this point, Dr. Thompson, the Surgeon of Her Majesty's 76th Regiment, has recorded the following important statement in reply to some observations of mine on the localities attacked in the late epidemic:—

Previous Cholera History of Thayetmyo.

Thayetmyo situated in a river basin.

"The station lies in a shallow basin. The Native Infantry is located on the best ground, namely, on a plateau along the edge of the basin, while the Royal Artillery and European Infantry are on the worst, *i.e.*, in the bottom of the basin. The superiority of the site of the native infantry barracks was particularly pointed out by Surgeon-Major Timins, senior medical officer, Thayetmyo, in a special report addressed by him to the Deputy Inspector-General of Hospitals, Pegu Division, dated 14th August 1861. The comparatively low situation of the existing European Barracks can be best judged of by crossing the river and looking down on Thayetmyo from the high ground above Allanmyo and Yuatoung, directly opposite.

Exemption of Native Infantry occupying the highest ground.

Europeans' Barrack occupy the lowest part of the basin.

"I examined this ground, first, with Colonel Hackett, Commanding, and Major Twyman, Executive Engineer, in April last, when selecting a site for a cholera camp; and, secondly, with these officers and Dr. Skelton, Principal medical officer, British Medical Service, in June, and we unanimously arrived at the conclusion that on sanitary and stratagetical grounds, the ridges above and between Allanmyo and Yuatoung were, to all appearance, better adapted for the erection

of barracks and the establishment of a cantonment, than the present site of Thayetmyo."

176. With the past experience of Thayetmyo, and especially of that portion of the cantonment occupied by the European Troops, I am afraid that, in all future epidemic invasions of Burmah, the troops in this locality must necessarily suffer. Not only is the situation disadvantageous in regard to its nearness to the great drainage channel of the valley, but the river being a navigable one for steamers and boats, is the great, and only, highway of traffic between Upper and Lower Burmah, and as cholera frequently appears on such lines of traffic, Thayetmyo must be peculiarly liable to invasion. The conditions of the locality, moreover, are such, that when cholera does get into the European Barracks, a great fatality may be looked for. It is well to note, moreover, that the conditions which localise the activity of the cholera contagium are limited, as to area. The Native Regiment, the European Officers of the cantonment, and the Sudder Bazaar are never affected in the same proportion as the men living in the European Barracks near the river bank. In 1863 the Surgeon of the Regiment, and another officer, died of cholera, but the former had necessarily been much of his time in localities under choleraic influence. In the outbreaks in 1869 and 1870 no European Officer, lady, or officer's child suffered, and only one man of the Native Infantry Regiment,—strength 643 was attacked.

Site of European Barracks, such as to invite attacks of cholera.

Vicinity of barracks to the Irrawaddy river, and dangers arising therefrom.

Choleraic area in Thayetmyo limited.

177. The removal of the affected troops to camp on the first outbreak in April would probably have been more effectual if they had been taken at once to the high ground across the river, instead of to the locality near the cantonment, fixed upon as a cholera camp. In this latter place, it would seem probable that the second outbreak on the 13th April was due to influences affecting the camp, for cholera had ceased temporarily to appear amongst the men and families who remained in their barracks. Whether the termination of the epidemic was influenced favourably by the movement across the river, or whether the removal of the camp was delayed until the outbreak was normally ended, it is hardly possible to judge. I am not quite satisfied, in this instance at least, that the removal into the camp near the cantonment was in any way effectual in the preservation of life.

Influence of removal to camp.

178. The weather at the time of outbreak was unusually hot and dry, and no rain fell until the 28th April, when the intensity of the disease had subsided.

Weather during the outbreak.

179. The malignant character of the cholera of this outbreak can perhaps be better estimated when I mention that of thirty-eight European troops attacked at Theyetmyo only eleven recovered. This gives a death rate of more than seventy-one per cent. to the numbers treated.

Great fatality of the cholera at Thayetmyo.

CHAPTER VI.

CHOLERA STATISTICS OF 1870.

180. The following table shows in one view the cholera deaths in the Civil population throughout the Presidency :—

Table showing Deaths from Cholera in each District of the Madras Presidency during each month of the year 1870.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Ganjam ...	7	3	8	12	14	9	46	198	66	2	2	15	382
Vizagapatam ...	...	9	5	11	...	10	72	78	51	...	21	2	259
Godavery ...	...	...	...	72	365	3,011	5,231	3,504	668	235	186	33	13,305
Kistna ...	...	...	12	6	...	70	566	1,129	201	62	8	...	2,054
Nellore ...	141	180	112	9	...	10	27	20	76	20	14	4	613
Madras ...	37	15	9	48	79	391	113	121	20	22	3	3	861
Chingleput ...	117	54	8	16	287	551	152	72	63	35	19	20	1,394
South Arcot ...	617	246	150	118	238	300	687	574	176	88	38	16	3,248
Trichinopoly ...	960	344	192	122	7	14	44	65	103	28	139	539	2,557
Tanjore ...	3,708	1,119	216	218	175	392	357	176	110	45	18	50	6,584
Madura* ...	18	70	323	275	307	531	621	1,445	933	479	330	324	5,656
Tinnevelly ...	8	46	258	637	1,721	1,911	1,246	626	398	142	45	573	7,611
Kurnool ...	...	..	...	...	...	...	...	...	...	...	...	...	...
Cuddapah ...	...	...	...	...	31	50	29	10	8	6	...	...	134
Bellary ...	...	...	...	...	...	...	...	...	...	...	...	...	...
North Arcot ...	83	102	98	99	935	899	334	389	176	113	227	140	3,595
Salem ...	560	443	271	215	141	206	567	521	172	69	40	319	3,524
Coimbatore ...	82	97	191	193	60	5	18	60	264	623	446	284	2,323
Neilgherry Hills.	...	...	...	...	...	...	...	...	...	...	...	...	...
South Canara ...	17	8	3	5	5	7	45	43	42	35	25	32	267
Malabar ...	8	7	31	35	77	199	150	218	103	110	141	421	1,500
Total...	6,363	2,743	1887	2091	4,442	8,566	10305	9,249	3630	2114	1702	2775	55,867

181. From this table it will be observed that 55,867 persons died of cholera in 1870, the number in the previous year, a period of new invasion, being only 21,034. The epidemic fell with peculiar severity on the Godavery District, and the Tinnevelly and Madura Districts, in the extreme south, which districts had escaped the invasion in 1869. In the invasion of the Presidency in 1864, the general mortality was higher in the second year than in the first, and highest of all in the third year of cholera prevalence. But in those years the seasons had been unfavourable for agriculture, and the prices of food were so high as to press severely upon the health of the poorer people, predisposing them to suffer from epidemic disease. The seasons of 1870 were unusually favourable for agriculture throughout Southern India. Food grains have fallen considerably in value, and the population, by being well fed and nourished, are better prepared to resist epidemic diseases. From the present distribution of cholera in the districts to the southward, which were the latest to suffer invasion, I am inclined to think that no general reproduction will occur in the present

The third year of invasion generally has highest mortality.

Influence of favourable season of 1870.

* Exclusive of Ramnad and Shevagunga Zemindaries, for which no returns were received.

year, in which case the cholera mortality of 1871 (the third year from the last invasion) may be expected to diminish instead of increasing as it did in the third year of the former invasion. If this estimate is based on a true appreciation of the facts of the past and present, then the population of Southern India may be expected to be free of a general distribution of the cholera pestilence, until a new epidemic cloud from the north shall again overshadow the land.

Cholera in the European Army.

182. The facts, in regard to cholera outbreaks in H. M.'s 45th Regiment in Fort Saint George, have already been noticed, and also the particulars of the lamentable outbreak in H. M.'s 76th Regiment at the station of Thayetmyo in British Burmah. The European troops at Bangalore suffered slightly when cholera affected the cantonment in June and July. There were seven admissions and five deaths at this station. With these exceptions the European troops of the Presidency were singularly free of cholera during the year. The station of Trichinopoly was attacked twice in the year, in January and December, but no case occurred amongst the European troops. The ratio of mortality to attacks amongst this class, it will be observed, is lamentably high, and shows that, as yet, Medical science has failed to produce any satisfactory results, as regards the treatment of the advanced stages of the disease.

Table showing the Total Deaths and Mortality from Cholera among European Troops at each Station of the Madras Presidency during the year 1870.

Stations.	Strength.	All Causes. Total Admissions.	All Causes. Total Deaths.	Cholera. Cholera Admissions.	Cholera. Cholera Deaths.	Ratio per 1,000 of Strength. All Causes. Total Admissions.	Ratio per 1,000 of Strength. All Causes. Total Deaths.	Ratio per 1,000 of Strength. Cholera. Cholera Admissions.	Ratio per 1,000 of Strength. Cholera. Cholera Deaths.	January. Admissions.	January. Deaths.	Feb. Admissions.	Feb. Deaths.	March. Admissions.	March. Deaths.	April. Admissions.	April. Deaths.	May. Admissions.	May. Deaths.	June. Admissions.	June. Deaths.	July. Admissions.	July. Deaths.	August. Admissions.	August. Deaths.	Sept. Admissions.	Sept. Deaths.	October. Admissions.	October. Deaths.	Nov. Admissions.	Nov. Deaths.	Dec. Admissions.	Dec. Deaths.	Per-centage of Deaths to Attacks.
Fort Saint George ...	767	798	19	12	6	1040·41	24·77	15·64	7·82	...	...	1	1	11	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	50
Saint Thomas' Mount.	463	592	24	...	...	1278·61	51·83	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Vellore	3	1	...	...	...	333·33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Poonamalee	158	454	5	...	...	2873·41	31·64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Palaveram	291	137	4	...	...	470·79	13·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Vizagapatam... ...	72	50	1	...	...	684·93	13·69	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Trichinopoly... ...	333	424	6	...	...	1273·27	18·01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Wellington	420	725	5	...	...	1726·19	11·9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bangaloro	1,893	4,387	22	7	5	2317·48	11·62	3·69	2·64	...	...	...	...	...	...	...	...	...	...	...	...	7	5	...	...	...	...	...	...	...	...	...	...	71·4
Cannanoro	663	633	8	...	...	954·75	12·06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Calicut	64	41	1	...	...	640·62	15·62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Malliapooram ...	79	84	1	...	...	1063·29	12·65	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bellary	959	1,058	8	...	...	1103·23	8·33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ramandroog	49	44	...	...	...	897·95	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Secunderabad ...	2,101	2,301	39	1	1	1095·19	18·56	0·47	0·47	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	100
Kamptee	1,001	1,690	9	...	...	1688·31	8·99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Seetabuldee	50	51	...	...	...	1020·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chindwarrah... ...	23	53	1	...	...	2304·34	43·47	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Rangoon	772	1,170	5	1	...	1515·54	6·47	1·29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	
Thayetmyoo	423	726	31	38	27	1716·31	73·28	89·83	63·82	...	...	...	...	...	...	28	21	1	1	6	3	3	2	...	...	...	...	...	...	...	...	...	...	71·05
Tonghoo	340	365	7	...	...	1073·52	20·58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Port Blair	111	65	2	...	...	585·58	27·02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total ...	11,035	15,849	198	59	39	1436·24	17·9	5·34	3·53	...	...	1	1	11	5	28	21	2	2	6	3	10	7	...	...	1	...	...	...	...	...	...	...	66·1

183. In only three stations was there any cholera mortality to speak of in the Native Army, viz., Madras, Bangalore, and Trichinopoly, all other stations, some of them within the influence of invading cholera, as Palamcottah, Quilon, and Thayetmyo, were remarkably free of the disease. At Madras the epidemic attacked the Regiment in the Perambore Lines, and at Bangalore the Sappers and Miners suffered most; at Trichinopoly the Regiment in the Potoor Lines furnished all the cases but two. These lines are the nearest to the Fort, and occupy a lower level and moister soil than the lines of the 9th Regiment N.I.

Cholera in the Native Army.

There was no movement of Native troops until the end of the year, and such marches as took place up to the 31st December terminated without cholera outbreaks.

The following table shows the cholera attacks and deaths of the Native Army in each month of the year:—

Table showing the Total Deaths and Mortality from Cholera among the Native Troops at each Station of the Madras Presidency during the year 1870.

Stations	Strength	All Causes. Total Admissions.	All Causes. Total Deaths	Cholera. Cholera Admissions.	Cholera. Cholera Deaths.	Ratio per 1,000 of Strength. All Causes. Total Admissions.	Ratio per 1,000 of Strength. All Causes. Total Deatsh.	Ratio per 1,000 of Strength. Cholera. Cholera Admissions.	Ratio per 1,000 of Strength. Cholera. Cholera Deaths.	January. Admissions.	January. Deaths.	Feb. Admissions.	Feb. Deaths.	March. Admissions.	March. Deaths.	April. Admissions.	April. Deaths.	May. Admissions.	May. Deaths.	June. Admissions.	June. Deaths.	July. Admissions,	July. Deaths.	August. Admissions.	August. Deaths.	Sept. Admissions.	Sept. Deaths.	October. Admissions.	October. Deaths.	Nov. Admissions.	Nov. Deaths.	Dec. Admissions.	Dec. Deaths.	Per-centage of Deaths to Attacks.
Madras	2,164	780	24	7	4	360·2	11·09	3·2	1·84	...	...	...	...	...	...	...	...	...	...	7	4	...	...	...	...	...	...	...	...	...	...	...	...	57·1
Saint Thomas' Mount.	183	141	2	...	...	770·4	10·9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Palaveram	131	253	4	...	...	1931·3	30·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Vellore	553	418	17	...	1	755·8	30·7	...	1·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
Vizianagram	652	83	8	...	...	127·3	12·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Berhampore	364	206	5	...	1	565·9	13·7	...	2·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	
Cuttack	684	261	7	...	...	381·5	10·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sumbulpore	265	469	5	...	...	1769·8	18·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Vizagapatam } Waltair } ...	785	542	16	...	...	690·4	20·4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bangalore	1,924	1,189	26	6	4	617·9	13·5	3·1	2·07	...	...	...	...	...	...	...	...	...	...	1	...	4	3	1	1	...	...	...	...	...	...	...	...	66·6
French Rocks ...	608	503	11	...	...	827·3	18·09	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cannanore	1,213	651	7	..	...	536·6	5·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Calicut	84	21	...	.	...	250·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mangalore	700	278	5	...	...	397·1	7·1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mercara	557	542	7	...	...	973·07	12·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bellary	1,752	639	14	1	1	364·7	7·5	0·5	0·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	
Kurnool	687	433	4	...	...	630·2	5·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mysore	61	62	1	...	...	1016·3	16·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Trichinopoly	1,363	482	13	12	5	353·6	9·5	8·8	3·6	7	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	41·6
Quilon...	455	161	4	...	...	353·8	8·9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Trichoor	167	51	2	1	...	305·3	11·9	5·9	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Trevandrum	79	38	...	...	...	481·01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Palamcottah	565	194	5	...	1	343·3	8·8	...	1·7	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Secunderabad ...	2,648	1,381	32	1	...	521·5	12·08	0·3	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kamptee	1,255	932	18	1	...	742·6	14·3	0·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	
Seetabuldee	453	435	4	...	...	960·2	8·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Hooshungabad ...	356	272	2	...	...	764·04	5·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Raepore	622	839	21	...	...	1332·7	33·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chandah	72	179	1	...	...	2486·1	13·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Seroncha	139	195	2	...	...	1402·9	14·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Rangoon	1,428	907	17	...	...	635·1	11·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Thayetmyoo	643	361	4	1	...	561·4	6·2	1·5	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	
Moulmein	370	485	11	...	...	1336·08	29·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Tonghoo	545	426	15	...	...	781·6	27·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Shoaygheen	112	191	2	...	...	1705·3	17·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Singapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Malacca	130	144	2	...	...	1107·6	15·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Port Blair	268	318	8	...	...	1149·2	29·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nicobars	61	372	4	...	...	6098·3	64·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total ...	25,098	15,834	330	30	17	630·8	13·1	1·1	0 6	7	4	3	...	1	...	...	...	...	1	9	4	4	3	2	3	1	...	...	...	...	...	3	2	56·6

184. The condition of prisoners, in regard to cholera during 1870, has been exceedingly satisfactory. Although the epidemic prevailed in many localities in which prisoners were confined, there was a very general immunity amongst that class of persons.

Cholera in Madras Jails.

185. The Medical Officer of the Nellore Jail has entered in his statistical returns eight admissions and seven deaths under the head "Dyspepsia," but in consequence of an explanatory note of that officer's, I have transferred these cases to, what I believe to be their true position, "Malignant Cholera." These cases occurred while cholera was raging in the town in the month of February, and, although some of the characteristic symptoms of cholera were not present in all the cases, I think there can be no reasonable doubt that the disease was cholera.

Doubtful cases in Nellore Jail.

The following is the Civil Surgeon's description of the disease :—

"The symptoms in all were very much alike, commencing with violent pain across the abdomen, purging and vomiting, the evacuations being watery, some colourless, others yellow and milky and of a thick muddy appearance, but at first all containing bits of undigested *cholum* (grain of Sorghum vulgare). In only one case does there appear to have been suppression of urine ; in all there was pain more or less severe in the abdomen, but none had pain or cramps in the extremities. There was great depression and restlessness, small weak pulse, and it is true many of the symptoms were of a choleraic nature, still I do not consider that they were suffering from cholera, but an aggravated and virulent form of dyspepsia; exhaustion rapidly setting in, from which they were unable to rally. In only one case was there genuine collapse."

Mr. Lloyd was inclined to attribute the origin of the disease to change of diet, as it began in the Quarantine ward amongst men not accustomed to Jail rations, but the particularly fatal character of the malady (seven out of eight attacks ending fatally), notwithstanding the absence of cramps and suppression of urine, points, I think, most clearly to its choleraic nature, and to the propriety of registering the attacks under the head of cholera. This disease, though beginning in the Quarantine ward (a place where newly admitted prisoners are detained fifteen days for observation) extended subsequently to the Jail itself, four of the admissions coming from the Quarantine ward, and four from the Jail wards.

186. The only other Jail, in which a severe outbreak of cholera occurred, was the old District Jail of Rajahmundry. Cholera was brought into the town on the 8th May by persons from an infected village, and it broke out in the Jail on the night of the 11th. The new Central Jail, with ten times the number of prisoners in it, had no cholera at all during this season of invasion. At Madura also the new Jail escaped, while the Civil debtors confined in the old Jail had five cases of cholera out of their small strength of fifty. Here there was an abundance of space available for the small number of prisoners, but the building was old, and possibly tainted.

Rajahmundry Jail.

Madura.

The following table shows the monthly admissions and deaths from cholera in all the Jails of this Presidency :—

Table showing the Total Deaths from Cholera in the several Jails of the Madras Presidency during the year 1870.

Jails.	Strength.	All Causes. Admissions.	All Causes. Deaths.	Cholera. Admissions.	Cholera. Deaths.	Ratio per 1,000 of Population. All Causes. Admissions.	Ratio per 1,000. All Causes. Deaths.	Ratio per 1,000. Cholera. Admissions.	Ratio per 1,000. Cholera. Deaths.	Monthly Prevalence of Cholera. January.		February.		March.		April.		May.		June.		July.		August.		September.		October		November.		December.		Per-centage of Deaths to Attacks.
Berhampore	180	90	6	...	...	500	33·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Calicut	159	155	7	...	...	974·8	44·02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chingleput	217	369	1	...	...	1700·4	4·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittoor	291	218	12	...	...	749·1	41·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuddalore	301	135	2	...	...	438·5	6·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Guindy	74	142	...	...	...	1918·9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Guntoor	100	91	...	...	...	910·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's Jail, Madras ...	24	31	...	1	...	1291·6	...	41·6	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Masulipatam	96	7	1	...	...	72·9	10·4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nellore	182	132	10	8	7	725·2	54·9	43·9	38·4	...	...	*8	*6	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	87·5
Penitentiary, Madras	488	656	20	2	...	1364·7	40·9	4·1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...
Rajahmundry, Central	845	402	3	...	...	475·7	3·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. District	89	103	5	16	4	1157·2	56·1	179·7	44·9	...	...	...	...	...	...	...	...	16	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25
Russelcondah	52	54	2	...	...	1038·4	38·4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vellore, Central	576	219	10	...	...	380·2	17·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Fort	152	46	...	...	...	302·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vizagapatam	265	109	9	...	...	411·3	33·9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bellary	384	482	16	...	...	1255·2	41·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cannanore, Central	452	438	27	...	...	969·02	59·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. District	58	10	...	...	...	172·4	...	...	...	...	...	...	...	...	...	...	...	Closed.		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cochin	17	38	...	3	...	2235·2	...	176·4	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuddapah	226	384	5	1	...	1699·1	22·1	4·4	...	...	...	...	...	...	...	...	...	...	...	...	...	†1	...	...	...	...	...	...	...	...	...	...	...	...
Kurnool	146	151	1	...	...	1034·2	6·8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mangalore	146	206	8	...	...	1410·9	54·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tellicherry	93	158	4	1	...	1698·9	43·01	10·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	‡1	...	...
Coimbatore Central	924	452	24	1	...	489·1	25·9	1.08	...	...	...	...	...	...	...	‡1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. District	137	143	2	2	...	1043·8	14·6	14·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...
Lawrence Asylum Works ...	243	397	1	...	...	1633·7	4·1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Madura, New Jail...	180	86	6	...	...	477·7	33·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Old Jail (Civil Debtors').	50	10	5	5	4	200·0	100·0	100·0	80·0	...	...	...	...	§1	§1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	...	§2	§2	80
Ootacamund, European	26	25	...	...	...	961·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Native	220	147	2	...	...	668·1	9·09	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Palamcottah	382	58	5	1	...	151·8	13·08	2·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paumben...	121	335	5	...	...	2768·5	41·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem, Central	466	209	2	...	...	448·5	4·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tanjore	177	82	18	...	...	463·2	101·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Trichinopoly, Central	716	121	17	...	...	168·9	23·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. District	185	67	11	...	...	362·1	59·4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tranquebar	139	85	7	...	...	611·5	50·3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total...	9598	7005	249	41	15	729·8	25·9	4·2	1·5	...	...	10	6	1	2	1	...	17	4	1	...	2	...	...	...	1	1	...	...	4	...	4	2	35·8

* Given as Dyspepsia in Return. Recorded as Cholera—see Report, page 139.
† Simple Cholera.
‡ Given as Choleraic Diarrhœa.
§ All among Civil Debtors in old Jail.

CHAPTER VII.

THE MOVEMENT OF CHOLERA VIEWED IN RELATION TO RECENT THEORIES.

187. There are at present two very contradictory theories entertained in regard to the phenomena of cholera movement. The one of most general acceptance perhaps is that formulated by the International Sanitary Conference at Constantinople in 1866, as follows:—

"*No fact has hitherto been brought forward to prove that cholera is spread abroad by the atmosphere alone, whatever may be its condition; and that, moreover, it is a law without exception, that an epidemic of cholera has never spread from one place to another in a shorter time than that necessary for man to journey between both places.*"

The other theory has been lately (1869) put forward by Dr. Bryden in an official report published by the Government of India.

"*The prevailing wind is the agency which directs the course of an advancing epidemic and determines its limitation in geographical distribution; the assertion that cholera may advance against a prevailing wind is contrary to fact.*"

188. Dr. Bryden's chief field of observation, whence he has drawn the above inference, has been the northern and central parts of India, subjected to the south-west monsoon rains, and here he has traced an apparent connexion between the advance of cholera and the direction of monsoon winds. He looks upon cholera indeed as a soil-bred miasm, not necessarily dependent upon man for renewal or propagation, but as a soil emanation that is borne aloft by prevailing winds, and carried by them out of the endemic area to localities more or less distant. Hence an endeavour is made to establish the proposition that cholera cannot move against a monsoon wind. However the facts coming immediately under Dr. Bryden's observation may seem to support such a conclusion, it is only necessary that I should refer to Scott's narrative of the cholera invasion of 1818, to prove, beyond the possibility of a doubt, that cholera did in that period traverse the Peninsula from east to west, and for many hundreds of miles from north to south, during the season of prevalence of the south-west monsoon, or, in other words, that an invading cholera advanced in opposition to a prevailing wind. There is also to be noted the remarkable fact that the change of monsoon from south-west to north-east did not hurry the advance of cholera over the Southern Districts. With the north-east monsoon wind blowing in its favour, it took nearly four months for cholera to travel from the latitude of Madras to the northern coast of the island of Ceylon. This one instance is, I think, quite sufficient to prove that Dr. Bryden's theory, in regard to monsoon agencies, does not rest on the firm basis of fact which he supposes. Nor does the theory of cholera distribution by monsoon winds in any way account for the circumstance that, simultaneously with the movement of a new epidemic out of Bengal in a north-west or south-west direction, a corresponding movement is going on to the south and south-east. If the monsoon winds of India blew in circles continually widening, or from a central point in radiating lines, it would be easy to understand how they might propagate cholera; but, as matter of fact, we know that the two great winds from the south-west and north-east prevail with great regularity, and that during their seasons of prevalence, atmospheric

movements are mainly in one direction, while cholera may be moving in various directions.

189. As regards the evidence of cholera movement to the south-east of the endemic field, I shall merely state that the tables in the Appendix show that the Military Stations in British Burmah felt the influence of the new emanation of cholera in Bengal in 1859 and 1863, just as much as did any stations in the south-western or northern "highways;" and as regards the years 1868 and 1869, the Appendix to my cholera report for 1869, and the report of the Sanitary Commissioner of British Burmah, both testify to the fact of a new invasion of the river valleys in Burmah in that year. From other sources I have satisfied myself, that the cholera in China of 1860 was a direct continuation of the south-eastern overflow, and I infer also that the cholera of 1864 at Singapore and other parts of the Straits Settlements was a direct continuation of the epidemic invasion of Burmah in 1863.

The last we hear of the 1868-69 invasion in British Burmah was a southward extension through the Tenasserim Provinces. The Sanitary Commissioner distinctly states that the dates of progress show that the epidemic "was travelling south," after the invasion of Mergui.

190. Before the scientific world can accept a theory that seeks to explain the spread of cholera to places so geographically remote as Peshawar and Singapore by the agency of monsoon winds, it will seek to know something about the direction and rate of progress of such winds, in connexion with the progress of cholera. It is manifest that the same winds that take cholera from Bengal to the Punjaub, cannot be instrumental in sowing the seeds of cholera over Burmah and China in the south-east.

The greatest obstacle to the reception of the monsoon theory of cholera invasion is, I think, the unquestionable fact that cholera is not checked in its movement by the prevalence of a strong monsoon wind blowing against its line of advance. The narrative of Scott of the 1818 epidemic, and the record at pages 18 and 20 of the 1859 and 1864 invasions are quite clear, as regards the movement of former epidemics. The southward and slightly eastward advance of the 1869 invasion in this Presidency was certainly not checked by the south-west monsoon, nor did it travel any faster when the monsoon turned round in its favour. That monsoon moisture favoured the multiplication of the cholera miasm is quite probable, but there is no evidence that prevailing winds checked or hurried the invasion. It is a fact too, beyond all question, that the southward advance of this same epidemic from Tinnevelly to Ceylon in 1870 was not checked by the strong southerly winds then blowing. It follows, therefore, that there is a movement of cholera independent of strength or direction of winds, and that aerial influences cannot be so all-powerful as indicated by Bryden.

191. I by no means wish to deny that the *matériel* for cholera propagation may not be conveyed to a distance by the atmosphere. Knowing how far sensible particles from the earth's surface may be moved, especially during certain electrical conditions of the atmosphere, by rotatory currents of air, I think it is very probable indeed that solid particles of cholera contagium, as of small-pox or any other contagium, may be thus transported from place to place; and it is possible also that the monsoon winds, which are moist, may have the power of carrying them for a limited distance, but there has been no relation shown as yet between the velocity of movement of cholera, and of monsoon winds. It is abundantly clear that the development of cholera in a province has no sort of relation to

the rapidity of movement of the air. The monsoon winds, at certain periods of the year, travel at the rate of from 200 to 300 miles in twenty-four hours, but I am not aware of a single fact which shows that cholera can advance, epidemically, at the same rate.

192. An attentive consideration of the facts embodied in the district tables of this report will show, I think, very clearly that the localisation of cholera in certain places, and the slow movement of an epidemic, the intensity varying greatly even in adjoining talooks, or in the same district, is very adverse to any mere theory that the cholera germ is dependent upon a moist monsoon wind for its transport.

193. The other theory of Dr. Bryden's, that the cholera miasm is in its nature wholly independent of man, is, I need hardly observe, without any trustworthy evidence in its favour, and until the actual condition of the population within the endemic field of cholera is known, we have not the means of profitably pursuing this branch of the inquiry.

194. To sum up the facts as ascertained regarding the movement of cholera, I think it must be admitted—

1st.—That an epidemic wave from the natural home of cholera reaches the Madras Presidency, after affecting the Central Provinces, a portion of the Bombay Presidency and the Deccan, and rarely, if ever, by the shorter route along the Coromandel Coast.

2nd.—That these epidemic waves of cholera recur at uncertain intervals, but generally once in four or five years.

3rd.—That the direction of the line of cholera advance in this Presidency is, generally, from north to south, and that the invading epidemic never entirely halts until the extreme southern limit of territory (including the Island of Ceylon) has been reached.

4th.—That the south-west winds do not stop or retard this southern advance, nor do the north-east winds hasten it.

5th.—That monsoon moisture has some relation to the seasonal intensity, and possibly also to the movement of cholera, although prevailing winds do not hurry or check its advance into unoccupied territory.

6th.—That the period of time occupied in the invasion of Southern India, has varied from six months to two years.

7th.—That increased rapidity of communication by railways and steamboats has not hastened the advance of cholera, the last epidemic in 1869-70 having taken four times as long to reach Ceylon as did the great epidemic of 1818.

195. Although Dr. Bryden's theory, in regard to the movement of cholera by aerial currents, does not seem to me to be warranted by ascertained facts, I am by no means prepared with a counter theory to explain why cholera should periodically move out of the land of its birth, radiating in every direction in which physical obstacles to its progress do not exist.

196. The phenomena of epidemic movement, as I understand them, may in some respects be likened to the circular waves which follow the displacement of water in a pool, when a stone is flung into the middle of it. Troubled water is first seen in the neighbourhood of the disturbing cause, and in a cholera epidemic, it is the tract immediately outside of the endemic area that is first troubled, whether that tract lie to the south-east, south-west, or the north-west. The fact that the sea lies to the south of the endemic area, and a mountain barrier to

the north-east, is a sufficient reason why we cannot look for an extension of the widening circle in those directions, but wherever there may be population, and an absence of hilly barriers to obstruct the circular extension of the cholera wave, it will continue to spread out, until it be lost in the extreme east of China on one hand, and Africa, Europe, and America to the west.

The cholera epidemic when once in motion, and with climatic conditions favourable to its increase, goes on widening, year after year, for the period of its natural life. The circle of the first year may be only a few hundred miles in diameter, but like the "fairy rings" in our meadows, it continues to grow and advance from its outer edge wherever no physical obstacles intervene.

And in this outward extension we shall find that uninhabited mountain tracts, or mountain tracts, the people of which hold little intercourse with the low country, also deserts, and seas, interfere with the regular expansion of the circle, while the points of protuberance of the advancing wave will be indicated by the valleys of great rivers, or tracts of country but little elevated above sea level.

197. It is to the fact of radiation of cholera, as from a centre, that we must explain its appearance, and progress in opposite directions, at the same moment of time in the Punjaub and Madras. In 1869 we know that cholera travelled north-west into Cabul at the very moment it was extending southward in the direction of Cape Comorin, and while travelling south in the Indian Peninsula, it was moving south-east towards China, and westward through the African Continent. So far as we know any thing of the history of cholera in Africa, it has never yet surmounted the mountain chain of the lake districts in the interior, and its ravages have been expended on the eastern side of that mountain barrier.

198. The true explanation of this tendency of cholera to extend outwards from its endemic habitat, I do not pretend to give. If I state my conviction that it finds the elements of its growth and renewal on the outer edge of the widening circle, I am merely repeating what everybody admits to be true, that cholera prefers to attack a locality which has been long exempted, and in which the population may be favourably disposed to receive and propagate the contagium.

199. What the law of susceptibility may have to say to this outward progress of cholera it is hard to say, inasmuch as we know nothing about such a law, though, practically in regard to some kindred diseases, we are content to acknowledge that people are the more liable to suffer an incursion, who have been, for a certain number of years, practically exempt from epidemic visitations.

And the same remark holds good of cholera; when a district is newly inva ded, it does not affect every spot of ground in the year of invasion; but should it outlive that year, the probabilities are in favour of the tracts exempted in the first year suffering in the next, or following season, so that the liability of a population to suffer from cholera, other things being equal, seems to bear some proportion to the previous period of immunity. And I think we must also be prepared to admit that the prior occupation of a locality by a wave of malaria or small-pox will, for the time being, have the effect of preserving the inhabitants of that locality from the cholera influence.

The effect of previous immunity seems well illustrated in regard to the Godavery and Kistna Districts, which entirely escaped epidemic invasion by cholera at the time when the invasion was normally due in 1869, but which districts, when the seeds of the disease were imported in March 1870, were quite ready to yield an abundant crop. The Godavery District suffered so

generally from cholera in 1870 that I hardly expect to hear of any seasonal reproduction there in this present year, but in the district of Kistna which was only lightly affected, the seasonal reproduction has already commenced (February 12th), and will, I doubt not, go on, until the unoccupied tracts of last year have been more or less completely invaded. In the same way I explain the facts of the invasion of the Western Coast territory in 1870, which had also escaped the downward wave in 1869. The attraction to cholera lay in the new country, and, although the epidemic had to pass down to the extreme south of India to turn the mountain barrier, it travelled up northwards just as easily as it has hitherto done southwards, because the unoccupied ground, and the population endowed with a proneness or susceptibility for the disease, lay in front of it. That this was the fact may also be inferred by the splitting up, as it were, of the southern wave, one limb passing on south to invade Ceylon (also ready for the reception of cholera by reason of long exemption), and the other doubling back upon itself to seize the unoccupied tract of the Western Coast.

The reluctance of cholera to retrace its steps over a lately invaded area is also well exemplified in the case of the Cuddapah, Bellary, and Kurnool Districts. When the pilgrims dispersed from Tripatty in May 1870, many must have travelled north-west through these districts; but they soon left the cholera behind them, for these districts had been recently invaded by a cholera wave passing on to the south, and the population, apparently, was not in a condition to receive and multiply the imported cholera. Moreover these districts were already under the influence of a wave of malaria, and on that account, it may be, cholera could establish no hold on them.

200. In its behaviour to the human race, cholera presents some striking analogies to small-pox. As regards an individual community, there are in both diseases the same peculiarities of invasion; of growth, or increment (modified and influenced by season), culmination, and rapid decline, followed by an interval of complete rest, the latter broken only by a new invasion. As regards small-pox we have no difficulty in recognising that it is a disease multiplying in, and spreading by means of, the human body, but we are still very ignorant of the laws which govern its periodical appearance in epidemic waves, or of the influence of season in hastening or repressing the culmination of an epidemic, and of the causes of its complete extinction for long periods together over vast tracts of country, which have never been invaded by the vaccinator. Those who dispute the influence of human intercourse in the distribution of cholera are, I think, bound to explain why small-pox, an acknowledged communicable disease, should become epidemic only periodically, spread up to its maximum power, subject all the while to seasonal influences, and then as suddenly die out. We know that the contagious particles of small-pox in a locality, at the acme of an epidemic, must be infinitely more numerous than at the beginning, and this being so, the question may well be asked why should the disease ever decline if it was capable of unlimited propagation? But the truth seems to be, in regard to this matter, as in regard to cholera diffusion, that there is a limit to epidemic distribution, and that this limit is reached, just as the minute particles of which the contagium consists, exist in the greatest abundance. By a law peculiar to themselves, the particles of contagium of, probably, all diseases of the infectious type cease to multiply beyond a certain number of years.

The maximum power of cholera, if we may judge from its fatality, is (accord-

ing to the death registers of this Presidency) not attained in the first year of invasion. The same law holds good in regard to other countries. The mortality in Great Britain was heavier in 1833, 1849, 1854, and 1866, than in 1832, 1848, 1853, and 1865, the actual years of invasion. So far as I can judge, the mortality in many of our districts goes on increasing from the year of invasion up to the third year, while other districts resemble more closely certain European countries, in which the life of the epidemic is not prolonged beyond two years.

201. When the rise and fall of small-pox epidemics come to be studied as we now study cholera, I have some reason for thinking that we shall find the law of movement on the outer edge of a circle, to be common to small-pox as well as to cholera. In tracing the movement of small-pox during the last five years in Southern India it has seemed to me that the wave of epidemic intensity passed from north to south, though moving more slowly than a cholera wave. This is not the place to detail the particular evidence on which I would establish the law of movement of small-pox. In another place I shall enter fully into the question, but would here protest against the assumption, so frequently repeated, in ignorance of the facts, that there is no analogy between the laws of progress and decline of a notoriously contagious disease like small-pox, and epidemic cholera. To my mind there are some very striking points of resemblance in the behaviour of the two contagia. Small-pox, in India, is wonderfully influenced in its progress by climate or season. It developes rapidly in the cool and dry months of November, December, January, February, and March, and sometimes so late as April or May, when it is as suddenly checked in its progress, pending the return of the season of the year favourable to its growth. In the same way there can be no doubt, I think, that the period of the south-west monsoon rains (when small-pox is held in check) is the season of the year most favourable for the development of the specific contagium of cholera, and that it is in these months it claims the largest number of victims. In both diseases there is the same tendency to increase through two or three years, up to a maximum of prevalence, which being reached, is followed by rapid decline and extinction. Small-pox, moreover, has its own cycle of increase and natural decline, as has cholera. These cycles, curiously enough, in this part of India, alternate, so that the years of 1867 and 1868, which marked the decline of cholera all over Southern India, were noticeable for a great and general augmentation of small-pox.

In connexion with the movement of epidemic waves of small-pox, I may here casually allude to its westward activity in the south of Europe, France, and England, during 1869 and 1870, following close upon the great Indian outburst in 1866, 1867, and 1868. It was undoubtedly the fact that the epidemic attained its maximum in France before it reached England, proving thereby a westward progress. In well vaccinated populations the susceptibility to small-pox is diminished, but its great development of recent years, in some of the European States, shows that the epidemic waves flowing from the east, reach the west now, as they did hundreds of years ago, though the people may be better prepared to resist the subtle influence of the small-pox contagium than they were prior to the days of Jenner.

202. In the study of the movement of cholera, I believe it is essential that we should examine most carefully the history of localities that have escaped attack during a season of epidemic invasion. If it be a fact that the occupation

of a locality by another miasm, such as that of marsh fever or small-pox, is antagonistic to cholera development in that particular field, the district statistics of mortality should furnish the necessary evidence of it. I am aware that this view has long been entertained by Inspector-General R. Lawson, and I am disposed to think that the facts, as to the great prevalence of fever in certain tracts untouched by cholera, seem to show a possible antagonism in the common pestilential diseases of the east, so that the marked prevalence of one disease, such as fever or small-pox, may be a cause of the temporary exemption of a locality from another disease, like cholera.

CHAPTER VIII.

PILGRIMS AND CHOLERA.

203. I believe we are fast attaining a clearer insight into the real connexion between pilgrim sites and cholera outbreaks, than we have hitherto reached.

Before I discuss the important bearings of such connexion, I shall briefly chronicle the facts of 1870, that have been communicated to me in regard to festivals in this part of the country.

South Arcot.—The festival at Trinamally in February passed off without cholera. The usual sanitary measures were adopted. Cholera was dying out in the district at the date of the festival.

Madura—Pulney Feast.—In March. 20,000 persons assembled. The usual sanitary measures were adopted. Cholera broke out rather violently, and the people dispersed; twenty deaths were noted by the Police. (The district had only recently been invaded by cholera, at the date of the festival.)

Madura—Chittra Feast.—May. A large concourse of people, but no increase of cholera. The epidemic had prevailed in the town during February, March, and April, but appears to have ceased temporarily in May and June; extra sanitary precautions adopted at the festival time.

Bellary—Mailar Festival.—February. 44,000 persons present. No sickness. (No cholera in the district.) Sanitary regulations adopted as usual.

Ganjam—Mahanadi.—Festival of Maha Sevaratri in April. 90,000 persons present. No cholera (none in the district.) Sanitary supervision as usual.

Tinnevelly—Trichendoor Festival.—In March. 40,000 persons present. No cholera at the feast; but the district was beginning to be invaded, and some people in returning to their homes got cholera. Usual sanitary precautions.

Kurnool—Brahmochavam Festival.—5,000 persons. No cholera (none in the district). Sanitary regulations carried out.

Bellary—Humphi Festival.—April. No cholera (not a case in the whole district). Usual sanitary measures carried out.

North Arcot—Tripatty.—Festival early in May. Severe outbreak of cholera; deaths from the 2nd to 5th May, thirty-four. No proper sanitary supervision of either Upper or Lower Tripatty can be made, as only "caste" people are permitted to ascend the sacred hill. Cholera was prevailing all about the locality from the time of invasion in 1869.

Madras—Conjeeveram.—Festival in May. Cholera had been prevailing at the place of assembly from October to February 1870. It broke out again in May

during the feast. 33,000 persons attended the festival. The dispersion of pilgrims from this site, and from Tripatty, was followed by a wide development of cholera over the North Arcot, Madras, Salem, and South Arcot Districts; sanitary measures carefully supervised at Conjeeveram; water-supply during the feast scanty and of doubtful quality. The temple tanks are used for washing and bathing, and the people drink freely of the same water.

Tanjore—Nagore.—August. Slight cholera in the district. No outbreak during Mussulman festival.

Upper Godavery—Budrachellum.—April. No cholera (none at the time in the district, except in a village where it had been introduced).

Tinnevelly—Adi Tirunal.—No cholera.

Madura—Matteaalunnen.—No disease.

North Arcot—Tripathy.—September and October. Two cases of cholera only noted at this festival. The invading wave had passed to the southward. Sanitary precautions taken, as regards Lower Trippatty.

Trichinopoly—Sreerungum.—Cholera appeared in the district in November; feast began in December. About 20,000 persons attended; the public being warned of the danger of cholera outbreak. Sanitary precautions taken. Medical aid provided. About 100 cases of choleraic diarrhœa were seen by medical attendant, and five of cholera. Cholera present in the town and cantonment of Trichinopoly before the feast began. A party of pilgrims from Hyderabad, about 100 in number, in returning home, took it with them to the Kurnool District, and several villagers (eighteen) who had been in contact with the pilgrims died. The disease was confined to a few villages where the pilgrims had halted. These pilgrims travelled from Trichinopoly to Ghooty by rail, and cholera appeared amongst them only after they had left the Railway.*

204. I am afraid that the list of places, where sanitary measures were adopted to avert or arrest cholera, is incomplete; but I have incorporated here all the places of which I have received reports. These reports I think sufficiently indicate the fact that, in districts where cholera is in activity, either by invasion or reproduction, the assemblage of pilgrims is usually attended with great risk; but that, in districts free of cholera, as were Bellary and Kurnool in 1870, the assemblage of pilgrims does no harm whatever. The practical lesson to be learnt in regard to this question is that, in the seasons of new invasion, or reproduction of cholera, every effort should be made either to forbid such assemblies, or to dissuade the people from attending them.

205. That the pilgrim sites are very important secondary foci of cholera, must, I think, be unquestioned by anybody who will take the trouble to make himself familiar with the past history of such places, or to read even the facts in connexion with the Tripatty and Conjeeveram outbreaks in the present year.

206. With all deference to those who have argued on the simplicity of abolishing cholera at these festivals, I think too much has been made of the introduction of necessary (though at present inadequate) sanitary precautions to prevent outbreaks of cholera.† The present system of conservancy

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* I have lately been informed that the deaths amongst the Hyderabad pilgrims were supposed by the local authorities of Hyderabad to be due to intentional poisoning, but this theory would not account for the deaths of villagers in the Kurnool District, in places where these people had halted.—(*W. R. C.*)

† "The Madras Commission has had the greater honour of showing, by a number of years' experience, that pilgrims can be preserved from cholera by easily executed and inexpensive sanitary measures."—(*Army Sanitary Commission*, 5th August 1870.)

and sanitary supervision of the larger religious festivals of the country was brought into play in this Presidency in the year 1864, when there was but slight prevalence of cholera. The absence of the disease therefore was held to have resulted from the simple measures of order and cleanliness enforced for the first time in that year. The newly invading cholera of 1864 did not reach the Madras District until August 1865, while the old epidemic had died out in the surrounding country. Knowing what we do now, we can see that outbreaks of cholera at Conjeeveram in 1864 and 1865 were not due to appear in the months of May of those years, neither did they occur. But in the cholera invasion of 1869, Conjeeveram had no escape, for the epidemic fell upon the town in October, and continued until February 1870, reviving again with the influx of pilgrims in May. The same remark applies to Tripatty, which suffered also in October 1869 and May 1870; but here the force of the epidemic had moved southward before the October festival occurred, so that at the latter festival we hear of only two isolated cases of cholera, and no general sickness at that period.

207. I believe that simple sanitary precautions should be enforced, at all times, with the class of people who constitute the bulk of pilgrim visitors to celebrated shrines, but it does not help forward the progress of sanitary science to credit attempts at enforcement of cleanliness and decency, with the power of averting the progress of an advancing wave of cholera. The *intensity* of the local outbreak may often be controlled by the exercise of common sense precautions, but the mysterious "something," to which choleraic disease is due, will come and go, irrespective of spasmodic efforts of purification, in the cleansing of streets or the erection of temporary latrines. If a cholera wave has recently passed over a district, or if the wave has not yet approached a locality, the assembly of pilgrims may take place without danger to the general community; but should cholera be actually in the neighbourhood, and active, the probabilities are much in favour of an outbreak, wherever a number of strange, ill-fed, and dirty people gather together, even should special arrangements be made for the preservation of their health.

208. It has seemed to me to be a very important portion of a Sanitary Commissioner's duties to keep always in view the progress of cholera in the territory under his supervision, so as to afford timely warning to local authorities of the probabilities of outbreaks at the district festivals.

Owing to the omission of the Police in the North Arcot District to report the activity of cholera in the north of the district, early in the year, I was unable to give any warning to the Collector of North Arcot of the impending danger of outbreak at Tripatty in May; but as regards festivals in Madura, Tinnevelly, Madras, Trichinopoly, and Kistna Districts, I was able to convey the necessary warnings, and urge the importance of sanitary precautions, and especially, of dissuading the public from attending gatherings where they might be exposed to unnecessary risk. As the record of cholera progress becomes more complete, so as to permit of greater accuracy of deduction, these warnings will, I trust, acquire a graver importance, not only with district authorities, but with the Hindu community at large, who are already disposed to stay at home, to a very considerable extent, when they receive timely notice of danger abroad. The intensity of cholera, and the prolongation of its epidemic visitations, are, I am convinced, largely due to the habits of the people in gadding about to divers places where

festivals are held, and by their unnatural modes of living during such seasons of festivity. The interests of the managers of Hindu Temples are frequently adverse to those of the Government, in dealing with the dangers which arise in regard to cholera invasion. The pecuniary interest of the temple authorities are at stake in inducing large gatherings of people at their periodical festivals, irrespective of the presence or absence of epidemic disease in the district. It would be to the interests of the State, and of the people themselves, to prevent such assemblages in seasons of epidemic sickness. It is now practicable to forecast, with tolerable accuracy, the results, as regards cholera outbreaks, at these annual festivals in the several districts, and it seems to me that the time is fast approaching when the subject may be dealt with by the Legislature, in such a way as to compel the parties interested in keeping up the system of pilgrimages to take upon themselves the responsibilities of sanitary provision for the assembled masses, and to enable the Government, on sufficient cause being shown, to forbid altogether the holding of festivals, in seasons when the public safety is likely to be endangered.

209. If Mr. Overbury's remarks, quoted below, in any way represent the true feeling of the better educated of the Hindu community, they must be, in a measure, prepared to welcome State interference in a matter of the gravest significance as regards public health.

* * * * * *

10. "From this brief history it is shown, beyond all doubt, that we are indebted to Conjeeveram festival for our recent loss of life by cholera. Were this, however, inaccurate in the particular case of Tripatore, I speak from experience of former years in this district, Cuddapah, and elsewhere, that Tripatty and Conjeeveram are the originators of this pestilence.

Festival.

11. "There are two festivals annually held in my division, at Tirtamallay and at Irulapatti. At each about 2,000 persons congregated. The frequenters are Vellalas, Pallees, and beggars.

Prevention of cholera.

12. "I cannot say that there is no cholera which is endemic, but I can safely affirm that it is chiefly epidemic. The only cure is the abolition of the festivals of Conjeeveram and Tripatty. And this I would request of you to urge on Government. From frequent conversations with the Natives, and from observation, I am convinced these festivals are losing their characteristics as religious ceremonies ; they are regarded by most in the light of fairs, and by beggars as a profitable lounge. Natives who are educated and wealthy rarely attend. As for the minor festivals, such as those held in my division, I would not suggest their abolition, as they are sufficiently rapidly, of their own accord, dying a natural death.

13. "With regard to the two larger festivals, however, the Natives are becoming aware of the concomitant evils which follow in their train, and the wiser of them stay at home. By their abolition, the sacred character of the locality in the eye of the Hindoos could in no way be impaired, as the May festival might be celebrated as before, the concourse of people at one spot only forbidden.

14. "Should, however, the Government decline to sanction their abolition, a strict quarantine, perpetually established at these places, superintended by Medical Subordinates, and paid for out of the Devastanum funds, should be rigorously insisted upon, as it is inconsistent with civilization that a surging wave of sickness should be annually propagated for the gratification of the few."

CHAPTER IX.

INFLUENCE OF SANITATION ON CHOLERA.

210. In this section of my report I propose, briefly, to review some of the facts of the past year, showing the influence which hygienic precautions have probably played in the exemption of certain communities from cholera. I may state in the commencement that, while agreeing with Dr. Bryden that an epidemic wave of cholera from Bengal will spread over unoccupied country (seasonal and other conditions being favourable to the preservation of the vitality of the contagium), I by no means agree with him in the cheerless doctrine he has laid down as to the inutility of sanitary precautions in limiting the destructive powers of cholera. He remarks (page 226):—

Dr. Bryden's view.

"What are called good sanitary conditions are not of themselves calculated to ensure our men against cholera. If it be true that cholera is air-borne and conveyed in the purest of all aqueous media, the conditions requisite for human infection are produced at the same time with epidemic advance; and hence local measures can be only comparatively successful, and are not absolutely calculated to avert the consequences of invasion.

"I see no occasion to look to impurity of the aqueous medium as of supreme consequence, and the search after special contamination, when every foot of grass-covered plain may retain the miasm, decoys the mind from the simple truth. * * We know well that some stations are worse than others, because of their natural disadvantages, but we know also that in the very best, general sanitation has not availed to prevent cholera."

211. I do not know what the sanitary condition of Bengal Military and Civil stations may be, but they must be very perfect indeed, and very different from what they were when the Cholera Commission of 1861 reported upon them, and a great contrast to any on this side of India, if no fault can be found with them, either in regard to locality, drainage, or water-supply. In the matter of water-supply alone, I am not aware of a single station in India where the possibility of freedom from contamination by cholera, or other contagium, can be absolutely guaranteed. A great deal has been done, and is still doing, to improve the sanitary condition of our troops, but to argue as if these conditions were already quite perfect, and that sanitary perfection, therefore, is powerless to preserve men during seasons of cholera invasion, is at any rate premature, while every candid person must admit that the whole question of the practical application of hygiene to troops is still in its infancy.

Sanitary condition of stations still imperfect.

212. The conclusion Dr. Bryden has arrived at, logically follows the theory of an "air-borne" miasm, and it is only necessary that I should remark here in regard to that theory, that it does not rest on such a basis of fact as to commend itself to the credence of men practically acquainted with the phenomena of Asiatic Cholera. On the contrary, many of the phenomena of every day occurrence in cholera epidemics are wholly inexplicable on such a theory; and, while they are so, there is not much practical danger that we shall neglect the observance of common sense precautions to guard against cholera. When it can be shown that cholera does *not* move against a wind, and that there *is* a direct relation between the movement of wind and the movement of cholera, it will be time enough for sanitarians to fold their hands and to admit the futility of their efforts, to mitigate the horrors of a cholera invasion. Meanwhile it seems to me that much may be done to

The theory of air-borne cholera wanting in proof.

abate the evil. And I believe that there is sufficient evidence already accumulated to show that sanitation has diminished mortality from cholera, as from many other diseases.

213. The evidence I shall offer on this subject will be brief, a few examples only, in the way of contrasts.

Cholera at Thayetmyo in Burmah.

(*a.*) The outbreaks of cholera on three successive occasions in 1863, 1869, and 1870, have been most virulent in the European Barracks occupying the lowest site, in a low basin, on the banks of the Irrawaddy river. The Native Regiment occupying ground on a higher level, and the officers and their families, also on higher ground, have generally escaped attack. In April 1870, there were 33 attacks and 27 deaths out of a strength of 423 Europeans, and only one native soldier out of a strength of 643 was attacked in the same time. No Military or Civil Officer, or European lady, suffered, but the women and children of the British troops were attacked equally with the men.

Fort Saint George.

(*b.*) The intensity of outbreak on 2nd March 1870 was confined to one barrack, in which cholera has frequently been known to localize itself. While cholera was prevailing in this circumscribed locality, the half million of native population outside the Fort were absolutely free. The insanitary conditions here were, doubtful water-supply (common to all the troops in the Fort), emanations from the town drain (stirred up by recent rainfall), and an open cut in the soil beneath the barrack flooring, the soil in which spot had been moistened by recent rain.

(*c.*) *Cuddalore Jail.*—Strength 301; no cholera; water-supply "excellent;" "dry earth conservancy" "a complete success."

Cuddalore Town.—Population 28,421; cholera deaths occurred in January, February, May, June, July, August, September, October; total deaths 42.

(*d.*) *Madura New Jail.*—Built outside the town on clean soil; wards airy and clean; water good, conservancy good; strength of prisoners 180; no cholera.

Madura Old Jail.—Building part of an ancient palace within the Fort; soil and water contaminated; fifty Civil debtors located here; space ample; five cholera cases, and four deaths amongst them.

Town of Madura.—Huts overcrowded; population 39,872; conservancy bad; foul privies, foul soil, and contaminated wells everywhere abounding; a year of cholera invasion; deaths from cholera 376; cholera prevailed in the town from February to May and from August to December. In the Madura district Captain Guthrie has noted the very frequent connexion between filth and cholera intensity.

(*e.*) *Rajahmundry New Central Jail.*—Building on an elevated site, outside the town; water of good quality from wells; wards airy; ample space; building quite new; strength of prisoners 845; not a single case of cholera; cholera prevailing violently in all the country around.

District Jail within the town.—Buildings old, and badly ventilated; strength of prisoners 89; cholera broke out in May; 16 cases in three days. Medical Officer writes, "during the month of May last when cholera prevailed in this jail, the cells were so hot that I could only compare them to hot ovens or heated air-baths, and I allowed the prisoners to sleep in the open air."

Rajahmundry Town.—Population 17,498; cholera deaths 147; epidemic began in May.

(*f.*) *Tanjore Jail.*—An old building in the heart of the fort; interior kept scrupulously clean; conservancy perfect; water from wells on the premises; strength of prisoners 177; no cholera.

Tanjore Town.—Cholera epidemic from January to March; population 36,941; cholera deaths 96.

(*g.*) *Vellore.*—New Central Jail outside the town; locality raised; clean soil; water good; wards clean and airy; strength 576; no cholera.

Old Jail in the Fort.—Building old, but kept clean; no overcrowding; water good; strength of prisoners 152; no cholera.

Vellore Town.—Population 30,529; cholera deaths 67; cholera prevailed all over the neighbourhood in the beginning of the year, and again in May and June and in December.

(*h*). *Salem.*—Jail built in 1861 on elevated ground, three miles out of the town; water from wells, good as regards organic impurity, but otherwise hard; conservancy and ventilation good; soil red, with gneiss rock underneath; strength of prisoners 466; no cholera since 1866.

Town of Salem.—Cholera prevailed in the town from September 1869 to February 1870, and again in July, August and December; population 33,072; total cholera deaths 98. The town lies in the bottom of a basin between high hills; its water-supply is of doubtful quality; soil abounding in nitrates; cholera always lingers in this natural basin near the river banks; the river water is defiled by the washing of dirty linen, and by human excrement.

(*i.*) The present and past condition of the village of Puthiamputtur, as detailed by Rev. Mr. Kearns, may be adduced as another instance of the benefit of sanitary control, in diminishing liability to cholera.

214. These are merely a few instances of contrast, in which the sanitary conditions, as to site and cleanliness of air, soil, and water, have apparently favourably predisposed limited communities to withstand the cholera contagium lurking about them.

The old and new jails at Salem compared.

215. I shall now illustrate this point at greater length by taking the history of the old Salem Jail, a notorious haunt of cholera, and comparing with it the history of the new Jail, in so far as the liability of the residents to cholera is concerned.

Old Jail, Salem.

216. The old Jail occupied a site which is thus described in the Medical Topographical Reports of the Madras Presidency, published in 1842. "The Jail is situated on the left bank of the river, in close approximation with the town; its site is low, damp, and confined; the soil is black earth, resting on an argillaceous calcareous base. * * "The floors were raised a few inches by bricks being laid edgeways in 1823, but they still continue damp." When I first saw this jail it had been abandoned. The walls of the building, up to a height of four or five feet, were covered with nitrous earth, and the flooring also. The wards were small, badly ventilated, and badly lit.

Water-supply.

Only brackish and undrinkable water was obtainable on the premises. The prisoners used river water, taken habitually from below a spot where a large number of the towns-people defecated, and washed their clothes, on its banks. How the inmates of this building became liable to cholera will be evident from the following tables:—

Cholera in the old Jail, Salem, 1829 *to* 1838.

Years.	Admitted.	Died.
Average yearly strength of prisoners, 239		
1829	119	50
1830	39	22
1831	3	2
1832	29	13
1833	81	43
1834	...	1
1835	...	...
1836	...	...
1837	43	24
1838	11	5
Total...	325	160

These figures give the following ratios :—

Annual cholera admissions to strength ... 135·9 per mille.
,, ,, deaths to strength ... 66·8 ,,

217. Some later data obtained for the period from 1855 to 1860, after which year the jail was abandoned, show the monthly or seasonal prevalence of cholera.

Salem Jail, 1855 *to* 1860.

Year.	Strength.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
		A.	D.	A.	D.	A.	D.	A,	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D	A	D.
1855	143	24	14	24	9	3	1	1	1	2	2	1	...	2	...	2	2	1	...	...	...	9	4	1	...	70	33
1856	195	1	1	3	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	6	2
1857	225	36	15	16	9	9	2	2	1	...	...	7	3	6	4	3	1	5	4	6	2	5	3	19	8	114	52
1858	257	10	5	9	8	9	6	7	3	...	...	..	...	1	...	2	2	...	...	...	...	1	...	10	5	49	29
1859	239	6	1	1	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	3
1860	244	...	...	1	...	...	...	...	...	10	5	1	1	2	2	1	...	...	...	...	...	...	...	3	2	18	10
Total.	217	77	36	54	26	25	12	10	5	12	7	9	4	11	6	8	5	6	4	6	2	15	7	33	15	266	129

These figures show a higher ratio of cholera in the last six years of the jail's history, than in the period when it was looked upon as a "new" jail. The proportions are as follow :—

Annual cholera admissions to strength ... 204·3 per mille.
,, ,, deaths to strength......... 99·0 ,, ,,

To such a degree in fact had cholera clung to this building, that of every one-hundred prisoners confined in it, one-fifth or twenty per cent. were sure to be attacked by the disease, while nearly ten of every hundred of strength would die of it.

Removal to new Jail in 1861.

218. We now come to a new stage in the cholera history of the prisoners at Salem. In 1861 they were moved into a new building at the foot of the Shervaroy Hills. This new jail was originally constructed of 120 cells to carry out a system of solitary imprisonment. For various reasons the idea had to be abandoned, and instead of keeping one

Great overcrowding preceding cholera outbreak of 1863.

prisoner in each cell, as intended, the numbers accumulated so fast that, in 1863, it is the fact, that seven men were locked up in a cell originally designed to hold a single prisoner. Subsequently, the jail has been much enlarged, and the solitary cells converted into wards, so that the jail now affords ample accommodation, according to approved sanitary regulations, for 500 prisoners.

219. The following table shows the strength and cholera admissions from 1861 to 1870:—

New Salem Jail, Cholera admissions from 1861-1870.

Years.	Strength.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1861...	308	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1
1862...	520	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...
1863...	498	1	...	...	...	21	7	58	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	80	39
1864...	395	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1865...	533	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1866...	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	17	7	1	...	...	...	3	1	22	9
1867...	650	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
1868...	574	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1869...	506	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1870...	466	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Average Strength...	517	2	1	...	...	21	7	59	32	...	...	...	...	...	...	1	1	17	7	2	1	...	..	4	1	106	50

From this table the following ratios may be deduced:—

Annual cholera admissions to strength 20·5 mille.

Deaths to „ 9·6 „

Thus in the last ten years the cholera admissions and mortality have fallen to just *one-tenth* of the average prevalence of the disease in the old building, during the later years of its occupation.

Explanation of outbreaks in new jail.

220. In the ten years to which this table refers there have been two cholera outbreaks in the new Jail, one in 1863, and the other in 1866. The outbreak in the end of March 1863 occurred at a time when cholera (the final break up of the 1859 invasion) was very rife in the Salem valley. Droughts and bad seasons had sent a large number of badly nourished persons into the jail, so that at the date of outbreak nearly 700 prisoners were locked up in cells built to hold only 120. All the advantages of site and locality, in fact, were temporarily nullified by a system of overcrowding which, with the present system of jail administration, is never likely to occur again. Cholera was introduced into the jail by a new gang of prisoners, and under the circumstances of their overcrowding, and previous bad health, the disease spread very actively for a few days. This cholera occurred in March and April, which are the hottest months in Salem. The last outbreak occurred in 1866, the third year of the 1864 invasion, and in this year again the people had suffered much from drought and famine, and the disease was proved to have been introduced by a new gang of prisoners. Cholera had no abiding-place in the jail. The outbreak ceased on removal of the affected prisoners to camp quite close to the jail.

Condition of population of Salem not improved as regard cholera from 1861-70.

221. It may perhaps be urged that the comparative freedom from cholera of the new Jail was due to the exemption of the Salem valley, and that the improved hygienic condition of the prisoners, especially since 1863, was nothing more than the normal condition of the people in the neighbourhood. But I have evidence to show that cholera was just as frequent at Salem in many of the years following 1860, as it had been at any former period. The following return of the in and out-patients treated for cholera at the Civil Dispensary, from 1845 to 1870, will show that the frequency of attacks had not diminished in the town, during the years of such marked change in the condition of the prisoners in jail. The change I attribute entirely to improved sanitary conditions, that is, to the choice of a better locality for the jail site; to better water; better food; and what is perhaps of still more importance, to better segregation from the cholera-stricken inhabitants of the town. The only two outbreaks in the last ten years were the direct result of importation, and the 1863 outbreak was much aggravated by the excessive overcrowding within the jail. In 1866 the whole country felt the influence of cholera, and its introduction into the jail, under the circumstances of a population suffering from actual famine, was almost certain.

Return showing Admissions and Deaths by Cholera among In and Out-Patients at the Civil Dispensary, Salem, from 1845 *to* 1870.

Years.	January.				February.				March.				April.			
	In.		Out.		In.		Out.		In.		Out.		In.		Out.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1845													No returns.			
1846	3	3	1	...	6	4	...	...	3	1	...	...	1	1	...	...
1847	2	2	12	8	2	...	6	4	...	1	6	1	2	...	4	2
1848	...	...	7	3	...	...	...	...	4	5	...	...	...	...	...	...
1849	...	...	9	3	...	...	5	2	1	...	...	...	...	...	1	...
1850	...	...	...	...	...	...	...	...	1	1	6	2	...	...	5	3
1851	...	...	...	...	...	...	1	...	...	...	2	1	...	...	3	3
1852	...	...	3	2	...	...	5	1	...	...	1	...	...	...	...	...
1853	...	...	...	...	...	...	8	1	...	...	1	...	...	...	1	1
1854	...	...	...	...	...	...	2	1	...	...	...	...	...	...	2	1
1855	8	...	8	4	4	2	2	...	2	...	3	1	1	1	...	...
1856	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1857	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
1858	2	...	4	...	4	1	3	...	2	2	4	2	1	...	1	1
1859	2	1	8	2	2	2	3	...	...	...	...	...	...	...	...	...
1860	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...
1861	5	2	16	2	4	4	11	1	6	4	5	...	2	1	7	...
1862	7	5	3	1	10	3	7	2	...	...	...	...	5	2	6	3
1863	4	4	17	1	2	2	12	2	...	...	4	...	2	2	3	...
1864	8	2	23	8	1	1	2	...	...	...	2	...	1	1	1	...
1865	...	...	...	...	7	1	...	...	4	2	15	1	5	3	5	1
1866	5	5	12	2	3	2	...	...	...	...	...	...	2	...	2	...
1867	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868	...	...	5	1	26	6	231	17	2	...	5	...	...	...	...	...
1869	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1870	1	...	45	9	1	..	1	...								
Total ...	50	26	183	46	72	28	299	31	25	16	54	8	22	11	42	15

Years.	May.				June.				July.				August.			
	In.		Out.		In.		Out.		In.		Out.		In.		Out.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1845															2	2
1846	2	2	...	...	2	1	1	1	...	...	...	...	...	...	...	...
1847	...	...	4	...	4	3	4	1	2	1	5	2	1	...	2	...
1848	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1849	...	...	2	1	3	1	2	2	1	...	3	1	...	...	...	...
1850	...	...	5	1	1	...	1	...	...	1	2	...	1	...	2	1
1851	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1852	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1853	...	...	1	1	1	...	1	1	2	...	6	2	...	...	...	...
1854	...	...	...	1	...	...	6	3	1	..	...	...	...	1	3	1
1855	...	...	1	1	...	...	3	2	...	...	5	3	...	...	...	...
1856	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1857	1	...	1	1	8	5	4	1	...	...	4	3	7	3	1	...
1858	...	...	...	...	...	...	...	...	4	1	1	...	...	...	...	...
1859	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1860	7	2	18	5	3	2	...	...	6	5	12	1	2	1	6	2
1861	1	1	...	...	5	2	1	...	2	...	3	...	3	3	9	2
1862	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...
1863	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
1864	...	...	...	...	...	...	...	...	5	2	5	...	...	...	...	...
1865	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1866	4	2	...	...	...	...	...	...	4	2	6	3	6	...	1	1
1867	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1869	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1870													No returns received for these months.			
Total ...	19	11	35	11	27	14	23	11	27	12	52	15	20	8	26	9

Years.	September.				October.				November.				December.			
	In.		Out.		In.		Out.		In.		Out.		In.		Out.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1845	2	...	...	...	2	2	...	...	7	4	2	1	17	10	...	...
1846	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1
1847	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1848	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1849	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1850	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1851	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1
1852	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1853	...	...	1	...	...	...	...	...	...	...	...	...	1	1	...	...
1854	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1855	...	...	2	1	...	...	1	...	3	3	9	1	...	...	1	1
1856	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1857	8	4	1	...	1	1	1	...	3	3	7	1	4	1	13	1
1858	...	...	...	...	...	...	...	...	1	...	1	1	6	1	3	1
1859	...	...	...	...	...	...	...	...	2	..	...	...	...	...	...	...
1860	...	...	...	...	...	...	...	...	3	2	6	...	4	7	5	...
1861	5	4	2	...	2	2	6	...	1	1	2	...	1	...	...	...
1862	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
1863	...	...	...	...	5	2	11	...	4	3	..	...	1	2	8	...
1864	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1865	...	...	...	...	...	...	...	...	...	...	...	...	12	7	24	4
1866	...	...	...	...	...	...	...	...	5	4	1	1	...	...	...	...
1867	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1869	...	...	...	...	...	...	47	16	...	...	14	1	2	1	8	2
1870																
Total ...	15	8	6	1	10	7	67	16	30	21	43	7	48	30	64	11

Years.	Total.				Grand Total.		Remarks.
	In.		Out.		Admissions	Deaths.	
	A.	D.	A.	D.			
1845	28	16	4	3	32	19	
1846	18	15	3	1	21	16	
1847	13	7	43	18	56	25	
1848	...	...	11	8	11	8	
1849	5	1	22	9	27	10	
1850	2	2	21	7	23	9	
1851	...	...	8	5	8	5	
1852	...	...	9	3	9	3	
1853	4	1	19	6	23	7	
1854	1	1	13	7	14	8	
1855	18	6	35	14	53	20	
1856	...	...	...	...	...	...	
1857	51	26	65	11	116	37	
1858	20	5	17	5	37	10	
1859	4	3	11	2	15	5	
1860	25	19	56	8	81	27	
1861	39	24	62	5	101	29	
1862	26	13	18	6	44	19	
1863	18	15	57	3	75	18	
1864	15	6	33	8	48	14	
1865	28	14	4	6	72	20	
1866	30	19	27	6	57	25	
1867	3	2	...	...	3	2	
1868	28	6	241	18	269	24	
1869	2	2	69	19	71	21	
1870					...	...	
Total ...	378	203	848	178	1266	381	

222. Another instance of good results following sanitary improvement may here be given.

Sanitary results of providing quarters for the Warrant and Non-Commissioned Officers of the Ordnance Department.

In the year 1864 my attention, as registrar of deaths in Madras, was drawn to a circumstance in connexion with the house accommodation of the Warrant and Non-Commissioned Officers of the Ordnance Department. In this year an Armourer Serjeant and his wife, recently arrived from England, took up their abode in an unhealthy locality, and in a few weeks both sickened and died of cholera. The facts were reported by me in the quarterly report on deaths in Madras, 1864, and in the following year the Sanitary Commission investigated the subject still further. They found that out of an average strength of fifty men, ten had died in five years, or in the ratio of forty per thousand per annum, and that amongst the families of these people—strength unascertained—there had been thirty-seven deaths during the same period. Of the total of forty-seven deaths twenty-four, or rather more than fifty per cent. of the whole, had been caused by cholera. This remarkable preponderance of cholera mortality led to inquiry, and it was ascertained that forty-two heads of families occupied houses in Black Town and John Pereiras, four in Chintadrapett and Vepery, and four only in public quarters.

The house accommodation was generally defective, giving an average of superficial space of only thirty-six feet for each inhabitant, and for this scanty accommodation the rents averaged about 14 rupees per mensem for each family. On examining the quarters, it was found that the sanitary condition of the locality was "good or fair" in twenty-two instances, and "bad" in sixteen. In twenty-five of the houses the water-supply was scarce and bad, so that drinking water had to be purchased and brought from a distance. In four instances all the water required for household use had to be purchased.

223. These facts were brought to the notice of Government by the Sanitary Commissioner on the 15th January 1866, and, in due course, new family quarters were built for the accommodation of the men and families on the Fort Esplanade. These quarters are separated from a crowded part of the Native Town by about 100 yards only. The cottages are single storied, with well raised floors, and are open to the sea breeze. They contain ample space; tolerably good water is available for use.

The new quarters were occupied as soon as finished, some in April others in December 1868, and a few in April 1869.

The strength of the occupants and their mortality since the change of residence is as follows :—

——	Men.	Women.	Children.	Total.
Strength	36	32	77	145
Deaths in 1868	1	...	...	1
„ 1869	...	1	1	2
„ 1870	1	2	1	4
Total ...	2	3	2	7

The seven deaths are thus accounted for—aneurism of aorta (1), congestion of lungs (1), old age and debility (2), bronchitis (1), convulsion (1), and cholera (1).

Causes of death.

224. The cholera case was that of a young child under five years of age, and was the only instance, in the ordnance lines, marking the cholera invasion of Madras of 1869. Had the cholera mortality among these people in 1869 and 1870 been in any way like that of the five years ending 1865, the Ordnance employés and their families would have lost *ten* lives from this cause, instead of *one*, in the two years in question.

Only a single case of Cholera since the occupation of the new quarters.

225. I wish it to be understood that 1869 and 1870 were both years of cholera prevalence in Madras, and that the immunity of the Ordnance employés in those years is not explainable on any other supposition than that their sanitary surroundings had been materially improved by the change to the new quarters.

The Inspector-General of Ordnance, in reply to a letter of mine on the subject, remarked :—

"The improvement in the health and comfort of the Warrant and Non-Commissioned Officers and their families, since their removal from the streets of Black Town, has been most marked and satisfactory. It is evident in the very appearance of the men, women, and children; and the former have, ever since the change, expressed their gratitude on account of the building of the new quarters."

226. But besides the special instances given, I think the history of the cholera invasion of 1869-70 affords many other examples of the protection of communities, whose sanitary state has been fairly good. In 1869, the European Troops at Secunderabad suffered scarcely at all from the invading epidemic while the native inhabitants of the cantonment, bazaar, and neighbouring city were dying in large numbers. At Bangalore and Bellary too the European Troops escaped in 1869. The same remark may be made of the European Troops at Trichinopoly in the beginning and end of 1870; they had no cholera, while the native population was experiencing a heavy visitation. The facts in regard to immunity from cholera of the jail population, during the last years of invasion 1869-70, can, I think, be explained only on the supposition that the sanitary condition and supervision of the prisoners is better and more effective than it was in past years. That the sanitary condition of prisoners is much improved is unquestionable. They have now ample space in sleeping barracks; a sufficiently nutritious dietary, suited for all classes; fairly pure water, and enjoy the benefits of an almost perfect system of sanitary supervision; and, lastly, they mix much less with the free population since the system of intramural labour has been followed, than they did in former years. The old unhealthy jails of Calicut, Coimbatore, Salem, Madura, and Tinnevelly have been abandoned for better buildings, on better chosen sites, and from this cause alone the proclivity to cholera attacks in those jails has been diminished. I need scarcely refer again to the fact that the prisoners in the old jail at Madura, during the past year, were just as liable to cholera in proportion to their strength, as they had ever been, while the inhabitants of the new jail preserved an absolute immunity.

Diminished death rate in Jails of Madras.

227. I think we may consider it an established truth that certain localities are specially liable to be invaded by cholera in preference to other spots in the same neighbourhood. The locality on

Cholera haunts should be abandoned.

which the European Barracks at Thayetmyo are built is undoubtedly a very dangerous one, inasmuch as no cholera invasion of Burmah has yet occurred, without that locality being struck by the invading epidemic. Rangoon, on the other hand, is a station in which epidemic cholera is almost unknown amongst European Troops. When places like Thayetmyo and the old Salem Jail show a marked preference for the receptivity of cholera, the wisest course is doubtless to abandon such sites, and experience has shown that it is not necessary to go to any great distance in search of a more healthy locality. It is not possible, in the present state of our knowledge of the laws of health, to guarantee immunity from disease in situations where the physical features of the locality are such as to attract epidemics, but sanitary experience can be utilized for the avoidance of such sites in future, and much more can be done to remedy natural disadvantages than has ever yet been attempted in India.

228. On the whole, so far from being discouraged at the results of the efforts made to diminish the liability to disease, I think the facts noted in this chapter afford us every hope of still better results in the future.

Indeed I trust that the day may not be far distant, when a systematic effort to attack and defeat cholera in its endemic home, shall be made with every prospect of modifying those periodical invasions of epidemics which now carry terror and dismay, and destruction of life, over nine-tenths of the habitable globe.

W. R. CORNISH, F.R.C.S.,
Sanitary Commissioner for Madras.

MADRAS, 1*st March* 1871.

APPENDIX I.

CHOLERA INQUIRY SPECIAL REPORTS.

(Section V. of the Code of Instruction of the Army Sanitary Commission.)

PALAVERAM.

1. *Station* ...	Palaveram ; 11 miles south-west of Madras.
2. *Presumed population.*	About 3,000 natives, and 1,000 European and East Indian.
3. *Height above sea level.*	About 35 or 40 feet.
4. *Height or depression in regard to surrounding country.*	There are two hills to the east and south, from the bases of which the ground slopes down to the cantonment. The cantonment lies on a gentle slope of ground with two conical, metamorphic hills, about 350 feet high, between it and the sea. Through the narrow gorge between these hills the sea-breeze rushes up with some violence. To the west and north the country is almost a level plain, in some parts cultivated with rice, and in others with dry grains. The plain is not densely wooded.
5. *How far from*	
(*a.*) *The sea* ...	About 6 miles from the sea.
(*b.*) *River* ...	The Adyar river runs to the north-west of the cantonment, about half a mile to the west of the barracks and hospitals. The river sometimes rises so high as to flood the lower barracks and parade ground. Usually there is a small stream of water flowing all the year round.
(*c.*) *Tank* ...	There are a few shallow tanks in the neighbourhood, but none which do not dry up in the hot weather. About three miles to the south-west are the remains of a very large tank, the bund of which is now partially destroyed. When this tank was in order it impounded the flood waters of the Adyar river, and an area of many miles must have been submerged.
(*d.*) *Marshy lands, and in what direction do these lie with reference to the locality.*	There is some low marshy land between the conical hills and the sea and also along the valley of the Adyar river, which, when water abounds after the north-east monsoon, is put under wet cultivation.
6. *Level of locality as regards water-level in adjacent river or lake.*	The general level of the station is about 15 or 20 feet above the bed of the Adyar river. This river, where it passes Palaveram, is an insignificant stream as to width and size. Occasionally the barracks of the European troops, which are built within half a mile of the river, are flooded, and in 1844 the lines of the Native troops, which then occupied a site between the barracks and the houses of the Officers, were destroyed by inundation.
7. *Description of surface of country around the station or locality.*	The country around Palaveram is quite open with some hills to the south-west, and laterite and alluvial plains to the west and north-west. The station is well exposed to breezes from the sea.

8. *The effects of configuration of the surface on movements of air currents, and on ventilation?*

Dr. Fitzgerald, a Medical Officer who has practically studied this question during a long residence at the station, has recorded as follows :—

"Palaveram occupies a very favourable position on the sanitary scale, and I believe that on the cholera map it appears without a stain. There have been cases of that disease in the station (and the past year 1860 afforded several), but they were instances of persons who had come from other places where it was raging epidemically, or else of men whose constitutions were broken down by habitual intemperance, or other causes.

"The position of the cantonment relatively to the adjoining hills has been looked upon, and often spoken of as faulty, inasmuch as they are supposed to intercept the sea-breeze, and to add considerably to the heat by radiation and reflection.

"Since I came to reside in this station I have paid considerable attention to this subject. I think that the general salubrity of Palaveram and its immunity from epidemic cholera are due, in a great measure, if not altogether, to its so-called faulty position.

"Owing to their conical form and the funnel-shaped gorge between them, the Palaveram hills do not intercept the sea-breeze, except from very limited spaces close to their base; but they divide it into different currents, which rush round their flanks and through the gorge already mentioned with accumulated force, and sweep through the cantonment in various directions.

"In its present position, moreover, the cantonment is open to the free play of the north-east and south-west winds, whereas had it been placed on the other side of the hills, there would have been nothing to prevent a Native town and bazaar springing up to seaward.

"There is another effect produced by isolated hills of moderate elevation, like those at Palaveram, which does not appear to be taken into account in connexion with this subject as much as it deserves. I mean their influence on the movement of the atmosphere. When this is perfectly still and motionless near the surface of the earth, there is usually, at the same time, a steady, though gentle, movement in its higher strata, and when the peak of a conical hill rises up through these, the obstruction it occasions gives rise to a number of broken currents of air around it, whose movement is communicated to the lower strata, and prevents that stagnation which often occurs on low level plains remote from hills. The effect also on the temperature of the higher strata of the atmosphere of masses of rocky hills penetrating them, tend to promote that movement and agitation of the surrounding air which is so salutary in such a climate as this. I have repeatedly verified for myself this influence of the Palaveram hills in producing currents of air in their immediate vicinity, when at a short distance, not the slightest movement was perceptible."

Having myself lived on the top of one of the hills for some weeks, ascending and descending daily, I can fully confirm Dr. Fitzgerald's remarks on the effect of the configuration of the hills upon the aerial currents which sweep over the cantonment.

9. *Country open, or encumbered with vegetation.*

Open. Scanty vegetation.

Nature of vegetation, trees, scrub jungle, and the like. — Prickly-pear abounds in waste places. Not many trees, and no low jungle.

10. *Geology.*

Nature of underlying rock. — The two conical hills which lie between Palaveram and the sea are outliers of the Chingleput hills. They are composed of a hard, small-grained gniess, rather dark in colour, and decomposing into a reddish surface soil. The stone is quarried, to some extent, for road-making and building purposes. The same rock underlies also the locality on which the cantonment is built. To the east, where the houses of the European Officials are built, the houses actually rest on a foundation of rock, but the parade ground and site of the European barracks consist of a reddish clay soil, beneath which is found, in patches, sedimentary laterite. The laterite deposit in the neighbourhood of Palaveram is nowhere of any great thickness. In some places in the river valley it rests on clay, and in other parts it is close to the underlying rock. The surface soil increases in depth towards the river bank, and the site occupied by the European barracks and family-quarters has some ten or twelve feet of clayey, or lateritic, soil intervening between the surface and underlying rock.

11. *Nature of soil and sub-soil.* — The surface soil is evidently an alluvial deposit, with a preponderance of reddish clay. It varies in depth from a few inches, near the base of the hills, to ten or twelve feet near the river. The sub-soil is the gravelly form of laterite, cemented together, apparently, by a silicate of iron.

(*b.*) *Porosity* ... — In the upper part of the cantonment, owing to the slope of the ground, water runs off freely. Near the river the soil is deeper, and not very porous.

(*c.*) *Absorptive properties.* — Undetermined.

(*d.*) *Chemical constituents.* — Do.

(*e.*) *Air in sub-soil.* — Do.

12. *Malarial diseases when prevalent?* — The Native population of Palaveram do not appear to suffer from malarious affections to any extent. Nor do the European troops.

The following figures show the proportion of admissions and deaths from malarious fevers in the Military force stationed here for the five years ending 1870.

European Troops.

Years.	Mean Strength.	Intermittent Fever. A.	Intermittent Fever. D.	Remittent Fever. A.	Remittent Fever. D.	Continued Fever. A.	Continued Fever. D.	Typhus Fever. A	Typhus Fever. D.	Typhoid Fever. A.	Typhoid Fever. D.	Total. A.	Total. D.	Ratio per 1,000 of Mean Strength. Intermittent Fever. A.	Intermittent Fever. D.	Remittent Fever. A.	Remittent Fever. D.	Continued Fever. A.	Continued Fever. D.	Typhus Fever. A.	Typhus Fever. D	Typhoid Fever. A.	Typhoid Fever. D.	Total. A.	Total. D.
1866	200	14	...	...	...	8	...	...	...	...	...	22	...	70·0	...	...	...	40 0	...	...	...	...	...	110·0	...
1867	254	3	...	1	...	17	...	...	...	...	...	21	...	11·8	...	3·9	...	66·9	...	...	...	...	...	82·6	...
1868	309	...	...	...	...	19	...	...	...	...	...	19	...	...	...	...	...	61·4	...	...	...	...	...	61·4	...
1869	353	...	...	...	...	8	..	...	..	...	...	8	...	...	...	...	...	31·6	...	...	...	...	...	31·6	...
1870	207	11	...	...	...	7	...	...	...	...	...	18	...	53·1	...	...	...	33 8	...	...	...	...	...	86 9	...
Native Troops.																									
1866	176	46	1	1	1	...	...	...	...	...	...	47	2	261·4	5·6	5·6	5·6	...	...	...	...	...	...	267·04	11·7
1867	140	31	1	1	...	...	...	...	...	...	...	32	1	221·4	7·1	7·1	...	...	...	...	...	...	...	228·5	7·3
1868	174	59	1	3	...	...	...	...	...	...	...	62	1	339·0	5·7	17·2	...	...	...	...	...	...	...	356·3	5·1
1869	115	28	...	1	...	...	...	...	...	...	...	29	...	243·4	...	8·7	...	...	...	...	...	...	...	252·1	...
1870	133	40	1	...	...	3	...	...	...	...	...	43	1	300·7	7·5	...	...	22·5	...	...	...	...	...	323·3	7·5

Palaveram is the Depôt of Native Corps on foreign service, consequently many of the fever admissions in the Depôt are not due to local malaria. Many men return from Burmah, the Straits, or China on account of fever.

Connexion of Malaria with Cholera. In this station there is a marked immunity both from malarious fevers and cholera.

13. *Condition of Agriculture.* The surrounding plains are very little cultivated, owing possibly to the thinness and poverty of soil. In the river valley, and wherever water can be stored for irrigation, some rice is grown, but there is not much cultivation around the cantonment.

(*b.*) *Drainage* ... The natural drainage of the whole station is good. Except for a few days in a year, when the river is in flood, there is always a free outlet for surface and sub-soil waters in the direction of the river valley. Surface drains and channels are kept in good order, and the fall of rain on the hill slopes gives sufficient velocity to carry off all surface impurity.

(*c.*) *Irrigation* ... There is very little irrigation in the immediate neighbourhood.

14. *River banks.* The right bank of the Adyar skirts the cantonment to the north-west. Usually the stream of water is small, but in the dryest seasons there is always some water flowing. The banks are from ten to fifteen feet above the river bed in this part.

(*b.*) *Level of water relative to surface of cantonment.* On the 23rd April 1870 I made the following observations :—

A well in a field near the bazaar, had water 21 feet below the surface of the ground.

A well near the Priest's house	13 feet.
A well at the Sepoys' Place of Arms	16½ „
One of a row of wells near the European barracks ...	11 „

The water level was, I believe, the same in all these wells. The distance from the surface depending on the fact that some wells were sunk in higher ground than others. The level of the water in the sub-soil near the European barracks corresponded very closely to the water level in the river bed, about half a mile distant.

15. *Position of inhabited buildings in regard to Higher ground.* The native bazaar at Palaveram stands on an undulating swell of ground, and has complete natural drainage except to the south, where the Chapel Hill, a bare mass of rock, rises a little above it. The Native Infantry lines are placed on sloping ground, below the level of the bazaar. The European Veteran Company and the European Barracks are located nearer to the level of the river, and on the lowest level of all. The Officers' houses are built along the bases of the hills, and from these, the ground slopes away down to the almost level plain on which the barracks and family-quarters stand.

16. *Sub-soil drainage.* There is no artificial sub-soil drainage, but, owing to the configuration of the surface, water does not stagnate in the sub-soil, the natural fall being towards the river bed.

Depth of water-line below surface in,

(*a.*) *Wet weather.* About seven or eight feet, in the barracks near the river.

(*b.*) *Dry weather.* From twelve to sixteen feet.

(*c.*) *When Cholera prevails.* There is no prevalence of cholera here.

(*d.*) *Slope of ground.* Towards the river.

(*e.*) *Buildings resting on rock?*	Some of the Bazaar houses and Europeans' houses are close upon rock.
(*f.*) *How long does water lie after rain?*	There is no stagnation of water.
(*g.*) *Surface drainage works?*	These are well laid out, and kept in fair order.
17. *Removal of foul water from town.*	No special measures have been adopted. The house drains generally end in road-side channels, but much of the soiled water sinks into the soil about the houses.
(*a.*) *Average consumption of water?*	Could not be ascertained.
(*b.*) *Drains, or no drains?*	The Bazaar has side street-drains, but when I saw them in April 1870, after some months of dry, hot weather, they had no fluid in them, and were partially choked up by drift sand, blown into them by the prevailing high winds.
18. *Surface drainage.*	Good.
Extent of stagnant water.	None.
Does rain flow off rapidly?	Yes.
19. *Cleansing of locality.*	Solid refuse is removed by carts, of which four are kept for the cleaning of the bazaar and lines.
(*a.*) *Condition as to cleanliness.*	The streets and Depot lines were kept exceedingly clean. Houses much the same as all Native houses. Some very clean, some dirty.
(*b.*) *Latrine accommodation.*	No latrines yet built for the bazaar. These are about to be put up. The residents resort to open fields, or the rocky ground to the south-east of the cantonment, which latter locality I found defiled with excrement. Many of the Native houses have privies on the premises.
(*c.*) *Court-yards of dwelling houses.*	The Sepoys' huts, the bazaar houses, and the residences of the European Veterans have privies generally in their court-yards, from which the excreta is daily removed. No cess-pits are existing.
(*d.*) *Streets, roads, &c.*	These are kept in excellent order; the main road is overshadowed by a fine avenue of Banyan trees.
(*e.*) *Disposal of excreta.*	Night-soil is carted away to waste ground near the river and buried. Street sweepings and ashes are removed to fields, where the cultivators turn them to account.
20. *Water-supply.* (*a.*) *Sources.*	The drinking water of the cantonment is obtained entirely from wells. These wells are either sunk down to rock level, or in some parts sunk through the rock until the spring level is obtained. A few of the wells near the European barracks are not used, the water, owing probably to some local peculiarities of soil, being rather salt; but generally speaking, the well water, though rather hard, is bright, clear, and sparkling, and remarkably free of organic impurity. In Native estimation Palaveram water is held in high repute.
(*b.*) *Quality as ascertained by Mi-*	No detailed chemical analyses of the principal drinking waters of this station have yet been made, but tested by the potassium permanga-

croscopic and Chemical examination.

nate, the ordinary sources of supply show a very slight amount of readily putrefiable organic matter.* Microscopically, no special forms of animal or vegetable life were noticed.

(c.) Impure water and Cholera.

The drinking water of this station being all obtained from wells sunk through a lateritic gravel and rock, and the wells being surrounded by parapet walls, and lined with brick or masonry when necessary, there would appear to be but little chance of accidental fouling of the water-supply by cholera discharges. Still such an accident may possibly occur, as all the wells are open mouthed, liable to receive dust and rain-fall, and each person drawing water uses his, or her, own vessel and rope to lift the water.

When Cholera occurs, does it spread equally over the whole area, or attack certain localities?

Cholera has never manifested any disposition to attack Palaveram. The cases hitherto occurring in the station have generally been of persons arriving from infected localities. In 1869, after the arrival of an infected detachment of European troops, some cases occurred amongst the native residents. The first case was that of a woman who had been to the camp of the infected troops. There were twenty-four attacks and seven deaths in that year amongst the bazaar people. (See Cholera Report for 1869). In 1870 there has not been a single case of cholera in the station, although it prevailed in villages not far away.

21. *Nature of house accommodation in Bazaar*

The ordinary tiled-roof single-storied house.

as to (a.) construction, materials, dimensions, &c.

Brick and mud, or red clay,

(b.) Number of floors.

One.

(c.) Cleanliness.

Ordinary.

(d.) Privy accommodation,

A small place in the yard is screened off for a privy.

(e.) Wells in relation to privies.

The bazaar houses have no wells generally speaking. Being located on high ground, the sinking of wells would be very costly. The public wells are far away for the influence of privy contamination.

(f.) Inhabitants crowded or otherwise.

Not crowded generally. There are many old and empty houses in the bazaar, which was originally laid out for the accommodation of three Native Regiments.

22. *Inspected houses.*

——

Peculiarities?

I examined some of the houses in which cholera cases occurred, in 1869 but there was nothing peculiar in them. Some were dirty and others tolerably clean.

Fungi on walls?

——

23. *Age of houses in relation to Cholera.*

The bazaar has been occupied fifty or sixty years. Nearly all the cases in this last outbreak occurred in old houses, the walls of which showed moisture rising from the surface. Some had green fungi on the brick-work, as high as two or three feet from the ground, but this was not peculiar to the houses in which cholera occurred.

24. *Food of the people.*

The Natives of this part of India are a rice-eating people. The poorer classes use dry cereals as well. Being within six miles of the coast, fresh and salt-fish enters largely into their dietary.

* Honorary Assistant Surgeon R. Harvy has completed some analysis of waters, while this report was passing through the Press. They will be found at the end of the Appendix.—(W. R. C.)

25. *Diseases of cereal and other plants before outbreaks of Cholera.*	None ascertained.
26. *Epizootics....*	None.
27. *Prevalence of*	
(*a.*) *Fevers.*	In the hot season, ardent remittent fever occurs amongst the European population, due, it is thought, to solar exposure. There is very little ague or dysentery.
(*b.*) *Small-pox...*	Occasionally prevails. The European community is well vaccinated.
(*c.*) *Guinea-worm.*	This parasite is unknown in Palaveram. All the cases seen at the Depôt were of people who have contracted the disease elsewhere.
(*d.*) *Parasitic affections of skin or intestines ?*	Not prevalent. A large number of European children come under observation, but the Medical Officer reports that worms are infrequent, compared with their prevalence in Madras and many other stations.
(*e.*) *Other special diseases.*	Elephantiasis, which is extremely common in the town of Madras, is not met with in this place. The Medical Officer has not seen it, and I could not learn that any of the bazaar people were so affected.
28. *Remarks ...*	In the Cholera Report for 1869 I remarked: "To the great advantages of soil, water, and situation, the station of Palaveram would appear to owe its powers of resisting epidemic influences. It has no absolute immunity from cholera, but the accumulated experience of very many years shows that cholera does not find a congenial home in the locality."

The experience alluded to, as regards Native Troops, extends over a period of forty-four years. During this period, of an aggregate annual strength of 53,600 troops, there were forty-four admissions from cholera and nineteen deaths, or in the ratio of 0·8 per mille of admissions, and 0·3 per mille of deaths to strength; the ratios in the whole Native Army for the same period being—

Admissions	...10·9	per mille.
Deaths	... 4·7	do.

The European Veteran Company has occupied the station since 1848. The cholera admissions and deaths amongst them up to the end of 1870 were as follows:—

Aggregate strength, 3,115, admissions, 14, deaths	10
Ratio of admission per mille	4·5
Do. of deaths do.	3·2

In the European Army generally

Admissions to strength	8·1
Deaths to do.	3·8

The liability to cholera it will be seen has been more marked amongst the European than in the Native Troops. In connexion with this circumstance I may note that the men reside on a lower level, as regards the river bank, than the Native Troops and bazaar occupy.

The greater number of the Veterans are married men, who live in detached cottages, all of which are kept extremely neat and clean. Of the several attacks of cholera amongst these men, I have noted that in six out of eight of the years in which cholera occurred, the first cases were observed in persons who had recently visited Madras, or some other cholera-stricken locality.

The families of the European Veteran Company are mostly large, and from 600 to 800 women and children reside in the station. In 1857, and again in 1865, there were a few cases of cholera amongst the families, due in both cases to importation. In 1869, when the bazaar population was slightly affected, not one of the European Soldiers, or of their families took cholera.

With regard to cholera amongst the Native Troops, many of the older reports are silent as to the antecedents of the men attacked. Of recent years, the Medical Officer's reports show that the occasional cases were all due to importation. There has been no case of cholera either in the European or Native Force of the station since the year 1866.

MADURA.

1. *Station* ...	Town of Madura, North Lat. 9° 50," East Long. 78° 12."
2. *Presumed population.*	Between 40,000 and 50,000. A new Census is to be taken in the course of the present year.
3. *Height above sea level.*	Six hundred feet.
4. *Height or depression in regard to surrounding country.*	The town of Madura is built on the left bank of the Vigay river, the principal stream of the district, and consequently occupies a low site in the river valley. There are low ranges of hills to the west and north. The town was formerly surrounded by a fortified wall and deep ditch, but the wall has now been levelled, and the ditch filled up.
5. *How far from*	——
(*a.*) *The sea* ...	About sixty miles from the Eastern Coast.
(*b.*) *River* ...	The town is built on the river bank. This river for most months of the year is a broad bed of sand with but little water visible on the surface, though an under-current is always flowing through the sand. In the north-east monsoon it rises ten or twelve feet, and for a few days is a broad and rapid stream.
(*c.*) *Tank* ...	No large tanks in the immediate neighbourhood.
(*d.*) *Marshy land, and in what direction do these lie with reference to the locality.*	The tract between Madura and the sea is mostly a level plain, with a good many shallow tanks and wet cultivation.
6. *Level of locality as regards water level in adjacent river.*	The ordinary level of the town is not more than twelve or fifteen feet above the sandy bed of the river.
7. *Description of surface of country around the station.*	The town lies in a river valley, which valley, especially on the right bank of the river, is two or three miles in breadth, and composed of a rich loamy soil of considerable depth. This soil is very fertile. Trees grow to a great size in it. It is rather extensively planted with cocoanut trees, and dry cereals. The left bank of the river, opposite the town, has a thinner covering of soil, and gneiss rocks appear on the surface not far from the river.
(*a.*) *Flat* ...	——

(*b*.) *Hilly* ...	Low ranges of hills lie to the west and north, and the Pulney and Travancore mountains to the west.
(*c*.) *Mountainous*	——
8. *The effects of configuration on movements of air currents and on ventilation?*	The climate of Madura is much affected by its vicinity to the Western Ghauts. Owing to its nearness to the rain-belt of the south-west monsoon, there are no hot winds. There are no hills near enough to interfere with the circulation of air. The climate is hot and at the same time, the air during the south-west monsoon season is humid.
9. *Country open or encumbered with vegetation?*	Generally open, though many plantations of cocoanut trees exist in and round the town.
Nature of vegetation, trees, scrub jungle, and the like.	Fine trees abound in the town, chiefly palms and fig trees. The banyan grows most luxuriantly in the rich soil of the Madura valley. No low jungle; all land cultivated about the town.
10. *Geology* ...	The valley is filled with rich chocolate alluvial deposit of considerable depth.
Nature of underlying rock.	The under-lying rock is gneiss.
11. *Nature of soil and sub-soil and depth.*	Below the alluvial, the sub-soil appears to be rather sandy, and is permeable by water. Water is found in the town from ten to fifteen feet below the surface.
(*a*.) *Temperature.* (*b*.) *Porosity.* (*c*.) *Absorptive properties.* (*d*.) *Chemical constituents.* (*e*.) *Air in sub-soil.*	No observations made in regard to these particulars.
12. *Malarial diseases when prevalent?*	Fevers prevail amongst the hill tracts, to the west and north, in February, March, and April, and the people living on the banks of the river suffer also from malarious fevers after the north-east monsoon rains. A great epidemic of malarious fever visited the district in 1810, continuing until 1812, and returning again in 1816.
Connexion of malaria with Cholera?	The town of Madura always suffers from cholera invasions when the epidemic movement is southward. It suffered in 1818, and again in the 1834 invasion, which, however, did not reach Madura until 1836. The disease broke out on this occasion three days after the 9th Regiment N. I. had passed under its walls. On the 3rd July a case of cholera occurred, and the disease soon spread over the southern portion of the town. Upwards of 1,500 of the inhabitants died on this occasion, but the Jail, which is usually a cholera locality, remained free. In this year the fever admissions in the Jail were *below* the average, so that there is no evidence to show a connexion between malaria and cholera. It is noted in the Medical Board records that the Regiment which brought cholera to Madura in 1836, contracted the disease at Mailoor, about thirty miles away from the town, and "that its line of march to Palamcottah could be distinctly traced by the ravages the epidemic made in every village in the vicinity of the encamping grounds."

13. *Condition of Agriculture.*	The immediate neighbourhood of Madura is very well cultivated.
(*a.*) *Nature of produce.*	Rice, millets, cocoanuts, &c.
(*b.*) *Drainage ...*	The natural fall of the drainage is towards the river.
(*c.*) *Irrigation ...*	Irrigation is practised so far as the water-supply will admit.
(14.) *River banks*	The town is built on the main river of the district.
(*a.*) *Infiltration of sub-soils.*	The subsoil, owing to the vicinity of the river bed, is always moist.
(*b.*) *Level of water surface relative to surface of town.*	From eight to twelve feet below the average level of the soil.
15. *Position of inhabited buildings in regard to Higher ground...*	The town being built on a river bank, it follows that higher ground lies behind it, and also on the opposite bank.
16. *Sub-soil drainage.*	None artificially.
Depth of water-line below surface in	
(*a.*) *Wet weather.*	Not ascertained.
(*b.*) *Dry weather.*	At the new Jail, seven to eight feet.
(*c.*) *When Cholera prevails.*	Cholera was prevailing in the town at the time of this observation.
(*d.*) *Slope of ground ?*	Slightly towards the river.
(*e.*) *Buildings resting on rock ?*	No. On alluvium.
(*f.*) *How long does water lie after rain ?*	Rain-fall does not pass off so quickly here as in more sandy soils.
(*g.*) *Surface drainage works ?*	Masonry channels have been put down in some of the main streets, of the town but the levels were badly taken. Some years ago the drainage of the town fell into the Fort ditch, but since this has been filled up, the out-fall has been unsatisfactory. Recently the Municipal Commission have been laying down V shaped surface drains in the minor streets and it is in contemplation to relay the principal surface drains, so as to secure a proper outfall for the sewage.
17. *Removal of foul water from town.*	The removal is not satisfactory. Sewage stagnates in many drains, and percolates into the soil.
(*a.*) *Average consumption of water ?*	Not known.
(*b.*) *Drains, or no drains ?*	Square open drains of cut stone, but in their present state they are not of much use in keeping the town clean.
18. *Extent of stagnant water.*	None.
Does rain flow off rapidly ?	Tolerably well. The fall towards the river on the town side is not very great.
19. *Cleansing of locality.*	For several hundreds of years past, Madura has been a foul town, most imperfectly cleansed. Twenty-five years ago, the Medical Topographical

Report published by the Medical Board speaks of the inhabitants having long been permitted to make the space in front of their houses the "public necessary," and the "depository of all sorts of rubbish." Things have not improved very much at the present day. The public streets are kept clean, but the back-yards and privy enclosures which are out of sight, are a mass of filth. The cross-lanes are so narrow that a cart cannot traverse them, and that heaps of refuse accumulate until the surface soil of the back-yards is considerably raised. Under Municipal action, measures are in progress for a better cleansing of the town, but it is not an easy matter to remedy the neglect of centuries.

(a.) Condition as to cleanliness. Very indifferent.

(b.) Latrine accommodation. Of late years open walled enclosures for use as public latrines have been put up, but vast numbers of people use only the privies in their back-yards, many of which are sodden with excrement.

(c.) Court-yards of dwelling houses. The majority of those inspected were dangerously foul.

(d.) Streets, roads, &c. Well metalled, and kept clean. The main streets are broad and well ventilated; but the cross-roads and by-lanes are much too narrow for health, or convenient cleansing of the town.

(e.) Disposal of excreta. A great deal in private houses is never removed at all, but simply buried in the back-yards. There are some cess-pit privies, and these when full are covered over with earth, and new ones prepared.

The Municipal carts are now available for all those who will bring their rubbish to them for removal. The Municipal rubbish is taken to a depôt outside the town.

20. *Water-supply.* The water-supply is taken from the river bed and from numerous wells within the town. Water is always obtainable by digging holes in the sandy bed of the river. The river water is soft and pure unless it be temporarily fouled by the habits of the people. The well water varies a good deal as to the amount of organic impurity, but many of the wells are dangerously contaminated by putrefying organic matter, derived doubtless from the process of surface fouling of the soil which has been going on for ages.

(a.) Quality as ascertained by Microscopic and Chemical examination. Well water not examined microscopically. A tank in the Great Temple, from which devotees drink, and consider the act a sacred performance, contained the foulest water I have ever come across. The water was full of a green vegetable growth, and besides this the decaying organic matter was so large, that I could obtain no reliable results with a standard solution of potassium permanganate, owing to the discoloration caused by the precipitation of manganese oxide. Numberless infusoria, some visible to the naked eye, were preying upon this decaying matter; the smell of the water was most offensive. At a time when cholera was rife in the town, I saw many "caste" people drink of this abominable mixture, with apparent relish. The temple tank has probably never been cleaned out since the building was erected. The tank is deep, probably below the level of the river bed, and fed by springs. Thousands of persons wash and bathe in it, and drink the water because of its holy character. The Municipal Commissioners have no power to interfere with this tank, which contains the foulest water in the whole town.

MADURA WATERS.

The following results were obtained, as regards the *readily putrifiable* organic matter in a few wells in the town tested by Angus Smith's solution of potassium permanganate :—

	Grains of Oxygen required per Gallon to decompose the putrid matter.	Remarks.
New Jail, Well No. 1	0·0560	—This water was considered unfit for drinking, and is not used by prisoners.
Do. do. No. 2 in garden...	0·0165	—Good water.
Pagoda Tank		Water acid, re-action. Thickness of peasoup. Full of animal and vegetable life. Fœtid. So full of vegetable growth and putrid matter that no permanent pink colour could be obtained.

Specimens supplied by Native Surgeon Antony.

No.				
1.	Well,	Ondy Moottoo Maistry's Well... ...	0·0560	Alkaline reaction.
2.	,,	North side of Pagoda	0·0560	Water opaque, milky.
3.	,,	West of Pagoda	0·0280	
4.	,,	In market, east of town	0·2940	A very impure water.
5.	,,	East of town near Arab Stables ...	0·0840	Contaminated.
6.	,,	North Avenny Moola	0·0420	
7.	,,	Near Police Office	0·0840	Contaminated.
8.	,,	West of Pagoda	0·0980	
9.	,,	South Massay Videe Street	0·0420	
10.	,,	North do. do.	0·0420	
11.	,,	Civil Dispensary Well	0·0840	Contaminated.
12.	,,	Near Captain Guthrie's house	0·0840	Do.
13.	,,	Flowerman's Street	0·0560	Do.
14.	,,	Front of Pagoda	0·0560	Do.
15.	,,	Fishmongers' Street	0·1400	Do.
16.	,,	Oil Mongers' Street	0·0840	Do.
17.	,,	River water from the Vigay	0·0140	Very pure at the time of examination.
18.	,,	Mr. Campbell's Well	0·0420	Fair drinking water.
		(The same after filtration)	0·0210	

(c.) Impure water and Cholera.

From the foregoing it will be evident that the towns-people of Madura do not, as a rule, enjoy the blessings of a pure water-supply, and in times past, it is the fact, that cholera epidemics have fallen heavily on the city. The river opposite the town would be an unobjectionable source of supply but for two reasons: the fouling of the sandy bed of the stream by persons who resort thither for natural purposes, and its use as the washing ground of all the dirty clothing of the town.

A scheme to bring water from the river, at a point a few miles above the town, was begun many years ago, but has never been completed. In connexion with this subject I may note that the prisoners in the new Jail, built about two miles out of the town on the same kind of soil, and nearly the same level as the town, had no cholera in 1870, while the Civil debtors remaining in the old Jail, within the town, to the number of 50 only, had 5 cases of cholera and 4 deaths. The water of the new Jail is obtained from wells sunk in clean soil, and is of nearly the same standard of purity as the water filtering through the

sandy bed of the river, while the water of the old Jail and neighbourhood shows evidence of soil contamination. There is one well in the new Jail, the water from which is impure, and it is not used. The old Jail, a building forming originally a portion of Trimula Naik's Palace, has had a bad cholera repute, as the following figures will testify :—

Cholera in old Jail, Madura, from 1855.

Years	Strength.	Jan.		Feb.		Mar.		Apl.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D	A.	D.
1855	174	2	2	3	3	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	1	7	6
1856	235	4	2	1	1	...	...	...	...	..	...	...	...	...	...	...	...	...	..	...	...	...	...	1	...	6	3
1857	210	1	1	23	10	7	4	...	...	...	...	...	...	19	11	...	...	1	1	...	...	...	...	...	...	51	27
1858	276	...	...	...	...	...	...	4	2	7	4	2	1	2	...	2	1	...	...	...	...	3	...	18	9	38	17
1859	177	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1860	181	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	...	...	...	1	1	...	...	5	3	9	6
1861	212	4	3	...	...	1	...	...	...	...	..	1	...	...	...	...	...	...	...	...	...	...	...	2	1	8	4
1862	371	7	4	8	4	6	4	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2	24	15
1863	277	1	1	2	1	3	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	7	2
1864	288	...	...	10	8	...	...	...	...	...	...	...	...	...	...	...	...	10	10	...	...	...	...	16	11	44	29
1865	243	10	5	5	2	...	...	...	...	...	...	..	...	...	...	2	2	3	2	...	...	7	3	3	2	30	16
1866	209	...	...	1	...	7	3	...	...	...	...	...	...	...	...	...	...	5	2	...	...	1	1	7	4	21	10
1867	476	1	1	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	4	2
1868	474	...	...	4	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...
1869	379	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
1870	50	...	...	...	...	1	1	..	...	...	...	...	...	...	...	...	...	1	1	...	..	1	...	2	2	5	4

When Cholera occurs does it spread equally over the whole area, or attack certain localities? So far as I could ascertain the residents of the dirty back streets suffer most. Some localities were pointed out to me where cholera deaths had occurred in 1870, and the houses and surrounding conditions, in a sanitary point of view, were most unsatisfactory.

21. *Nature of house accommodation* There are many fine upper-storied houses built of masonry in the town, but the poor people live in mud houses of one storey only.

as to (a.) construction, materials, dimensions, &c. ——

(b.) Number of floors. ——

(c.) Cleanliness. ——

(d.) Privy accommodation. Everywhere deficient or defective.

(e.) Wells in relation to privies. Many wells in the town a great deal too near to privies.

(f.) Inhabitants crowded or otherwise. Yes; the old Fort wall was three miles in circumference, and upon the area within, from 30,000 to 40,000 persons were congregated. Since the demolition of the Fort wall, the town has spread out a little, but not much. The population of the back streets is still very tightly packed. The town contains about 10,000 houses.

22. *Inspected houses.* ——

23. *Age of houses in relation to Cholera.* The town is very old, but the age of houses it is very difficult to get at, as most of the buildings have been rebuilt many times since the town came into existence. The building used as a Jail is from 200 to 300 years old, and the cholera history of that building for the last fifteen years is given above.

24. *Food of the people.*	The people of this district, especially the weavers and agricultural population, use dry grains chiefly, such as cumboo, raggy, and cholum. In other respects their food is the ordinary food of the Natives of India. The wealthy and high caste people all use rice instead of dry grains.
25. *Diseases of cereal and other plants before outbreaks of Cholera.*	No evidence.
26. *Epizootics...*	Cattle diseases are common in the district, in certain years. An eruptive disease, accompanied by diarrhœa, is the most common form.
27. *Prevalence of*	
(*a.*) *Fevers* ...	Malarious fevers common after the N. E. monsoon rains.
(*b.*) *Small-pox...*	An epidemic has lately affected the town. The Municipality now employ Vaccinators of their own.
(*c.*) *Guinea-worm.*	Very common over the whole district in the dry hot months of the year. It is said to be most frequent on the black soils.
(*d.*) *Parasitic affections of skin or intestines ?*	No information.
(*e.*) *Other special diseases.*	The "fungus disease" of the foot is more frequently met with in the black soils of this district, than in any other part of the country. During the last twenty years some hundreds of cases have been treated at the Civil Dispensary, where the diseased mass has generally been removed by amputation.
28. *Remarks* ...	If a polluted soil, high average level of sub-soil moisture, and impure water have any effect in the localisation of cholera, then these conditions are all present in the town of Madura. The occupation of the new Jail outside the town, in the beginning of 1870, is so recent, that it is hardly fair to draw any conclusions as to the effects of improved sanitary conditions on the prisoners' health. Still I may call attention to the fact, that in a year of new invasion, the prisoners in the new Jail escaped cholera altogether, while the fifty Civil debtors detained in the old Jail had no less than 5 cases of cholera. The cholera deaths in the town during 1870 were 354.

SALEM.

1. *Station* ...	Salem, chief town of the Collectorate.
2. *Presumed population.*	By the last Census 33,000 inhabitants and 6,311 houses. At the Census taken in 1835 there were 19,021 inhabitants and 3,821 houses. Both population and houses have nearly doubled in the last thirty-five years, notwithstanding the ill-repute of the locality for health. Between 1801 and 1835 the population had increased by 87 per cent. This was due, in a measure, to the location of the East India Company's Weaving Establishment at Salem. Weaving is still the chief trade of the town.
3. *Height above sea level.*	1,090 feet.

4. *Height or depression in regard to surrounding country.*	Salem lies in a basin, and is shut in on all sides by hills. The town is built mainly on the banks of the Teromany river, a small stream taking its origin in the neighbouring hill ranges. From the bases of the mountain ranges the surface declivity on both sides is towards the river banks, so that the town lies actually lower than the surrounding country.
5. *How far from*	
(*a.*) *The sea* ...	About 200 miles from the Eastern Coast, and nearly the same distance from the Western Coast.
(*b.*) *River* ...	The Teromany river runs through the town, and ultimately joins the Cauvery. It has high banks. On the east side of the town the water is impounded by a dam for garden irrigation. The supply of water never entirely fails, though in the dry months it is scarce.
(*c.*) *Tank* ...	Many tanks abound in the Salem valley, but they dry up in the hot weather.
(*d.*) *Marshy land, and in what direction do these lie with reference to the locality.*	None. There is a good deal of wet cultivation on all sides. The ground slopes towards the river bed, so that the natural drainage of the valley is excellent.
6. *Level of locality as regards water level in adjacent river.*	The level of the river bed opposite Salem is about 15 to 20 feet below the level of the river banks, and these banks constitute the lowest level in the town.
7. *Description of surface of country around the station or locality.*	The Salem valley lies in between the Shervaroy and Kollamully ranges of hills. The country all about the hills is broken and covered with forest, but the valley itself is beautifully cultivated in every available spot of ground, more with dry cereals and oil seeds than rice. In good seasons two or three crops of dry grains are obtained, and the cultivators understand the value of animal manure, folding their flocks and herds on the ploughed lands as is done in Great Britain.
(*a.*) *Flat* ...	——
(*b.*) *Hilly* ...	——
(*c.*) *Mountainous.*	——
8. *The effects of configuration on movements of air currents, and on ventilation?*	The neighbouring hill ranges no doubt influence the currents of air, but no minute observation has been made. A strong wind blows in from the west, generally between 7 and 8 P.M., in the hot season, supposed to be the representative of the sea-breeze on the Western Coast. Dust-storms prevail in the hot months, but the station feels the influence of both south-west and north-east monsoons. The hills attract a much larger rain-fall than the valley. The quantity measured on the Shervaroys is about double that which falls at Salem. Owing to the proximity of hills, the atmosphere is a good deal clouded in the monsoon months. Early in the morning, in the month of July, I noticed a strong current of cool air setting in from the north-west, apparently from the Mysore plateau.
9. *Country open or encumbered with vegetation? Nature of vegetation, trees, scrub jungle, and the like.*	In looking down from a height, the town of Salem is scarcely distinguishable, being buried as it were in a forest of trees, which overtop and conceal the houses from view. Cocoanut palms thrive very well, and so do the tamarind and fig trees. There is no jungle nearer than the neighbouring hills. The town itself is well planted with trees.

10. *Geology.*	
Nature of underlying rock.	The rocks are all metamorphic, chiefly hornblendic gneiss. There are evidences of volcanic action close by the town, where trap has been injected into the decomposing gniess, thereby converting the magnesian base into a white mineral (magnesite). The gneiss in some instances has an appearance of stratification, and the beds are apparently displaced, tilted to an incline of 75°. In the neighbouring low range of hills magnetic oxide of iron is found in large quantity, and the Salem steel made from the local ores is of high repute. A conical hill near the Railway Station is made up almost entirely of veins of iron ore. Gneiss rock is exposed a good deal in the river bed, and generally is not far from the surface, in the area occupied by the town. The soil on the uplands is rather thin and consists of a ferruginous loam, but in the valley near the river it is darker in colour and more clayey in texture. The soil of the town is somewhat calcareous, and has the property of nitrifying organic matter. Earthquakes are not uncommon in the Salem and Shervaroy Hill districts.
11. *Nature of soil and sub-soil and depth.*	
(*a*) *Temperature.*	Not yet determined.
(*b*) *Porosity* ...	Do.
(*c.*) *Absorptive properties.*	Do.
(*d*) *Chemical constituents.*	Do.
(*e.*) *Air in sub-soil.*	Do.
12. *Malarial diseases when prevalent?*	Intermittent fever is endemic in the valley, and mountain slopes. It prevails mostly in the first quarter of the year, when easterly winds and great diurnal changes of temperature prevail. New-comers to the station are said to be particularly liable to it. The mountainous parts of the district are thought to be specially malarious just before the south-west monsoon has set in.
Connexion of Malaria with Cholera?	There is some coincidence in the seasons of cholera and fever, as both appear most frequently in the cold weather months. Salem does not usually suffer in the first year of a cholera invasion. As it is one of the last districts to be attacked, it reproduces cholera for a longer time than most other places.
13. *Condition of Agriculture.*	Very satisfactory. The farming of the Salcm valley is the best I have seen in India, so far as dry cereals, cotton, &c., are concerned.
(*a.*) *Nature of produce.*	Cereal grains, oil seeds, cotton, tobacco, &c.
(*b.*) *Drainage*...	From the tilted condition of the strata of rocks it is difficult to keep water in reservoirs in the valley. The tanks are dry early in the year, and fill again with the south-west monsoon. The general drainage of the valley is good.
(*c.*) *Irrigation*...	Practised wherever water is obtainable.
14. *River banks.*	The ordinary level of water in the river is considerably below the bank levels.

(a.) Infiltration of sub-soils.	The soil along the river bank must necessarily be always moist, from the fact of the percolation of moisture from land at a higher level. The town is mostly built over a track which is subjected to subterranean moisture for many months of the year.
(b.) Level of water surface relative to surface of towns and in villages.	——
15. *Position of inhabited buildings in regard to Higher ground...*	The houses of the town are nearly all in the condition of having higher ground near them. The fact of the moisture of their basements is evident from the way in which nitrous earth forms about them, corroding the brick-work of the walls, and permitting damp exhalations to rise through floors and walls.
16. *Sub-soil drainage.*	The river running through the town is the chief drainage channel, and being much lower than the town, it to some extent drains the subsoil.
Depth of water-line below surface in	——
(a.) Wet weather.	Near the river about seven or eight feet. On higher ground more.
(b.) Dry weather.	——
(c.) When Cholera prevails.	——
(d.) Slope of ground?	Towards the river.
(e.) Buildings resting on rock?	Rock is found very near to, and in some places quite close to, the surface.
(f.) How long does water lie after rain?	No stagnation of water after rain.
(g.) Surface drainage works?	A few street drains have been executed, leading sewage to the river.
17. *Removal of foul water from town or village.*	No means available, except the surface channels just alluded to.
(a.) Average consumption of water?	Not ascertained.
(b.) Drains, or no drains?	No underground drainage.
18. *Surface drainage.*	See Answer to 16.
Extent of stagnant water.	——
Does rain flow off rapidly?	——
19. *Cleansing of locality.*	The streets are cleansed daily by hand labour, and the solid refuse carted away. This refuse has been largely used to fill up holes and excavations in the surface soil in waste places of the town.

(a.) Condition as to cleanliness. Salem is kept, externally, cleaner than the average of Native towns.

(b.) Latrine accommodation. Very defective. Square enclosures have been put up, for public use and the sweepers I found were in the habit of burying ordure in the soil of the latrine floor. Cultivated fields abound in the town, and these are used by the people in preference to the latrines, which were very offensive at the time of my inspection.

(c.) Court-yards of dwelling houses. Tolerably clean. The custom of keeping cattle in the back-yards exists here. Amongst a population depending so much upon milk and butter for its animal food, it is difficult to lay down rules for the exclusion of cattle.

(d.) Streets, roads, &c. Most excellent roads and streets exist in Salem. The Municipality has recently spent about 20,000 rupees in making and repairing roads.

(e.) Disposal of excreta. The latrine filth of the public latrines I found was never removed at all, but buried in the soil, until the whole floor had become a putrid and offensive mass. The town abounds with cess-pit privies, which are either never cleaned at all, or on rare occasions only. So far as I could learn nothing had been done for the removal of the filth of the town. Ordinary rubbish, such as ashes, litter, &c., was used for filling up hollows, and when the holes were full, a thin coating of soil was put upon the top.

20. *Water-supply.* The town of Salem has between 2,000 and 3,000 wells, public and private, and about thirty large bowries for the use of the public. Water is found, according to the height of the ground, from six to thirty feet from the surface.

The well water is mostly hard and brackish. The Natives drink it, but many prefer to get their water from the Teromany river.

(a.) Sources ... The river bed near the Upper Anicut is used as a place for washing dirty linen. The banks also I found much fouled by human excrement. The chief draught of water for domestic use occurs *below* the spot where these nuisances exist in greatest abundance.

(b.) Quality as ascertained by Microscopic and Chemical examination. I tested several specimens for readily putrefiable organic matter, and the results are appended.

SALEM WATERS.

Description of well.	Oxygen required per Gallon of water.	Remarks.
Salem River (July)	0·0420	Water opaque, earthy.
Kitchapollem, Well No. 1	0·1540	An impure water.
Do. do No. 2	0·0560	
Moodo Therevoo	0·0250	
Mr. Boulth's Compound	0·0350	
Mr. Prichard's Compound	0·0420	
Raja Moodelly Garden Well	0·0420	
Pariah Village, No. 2	0·0280	
Mr. Arunachellum's house	0·0980	Bad.
Near Police Lines	0·1050	Do.
New Market place	0·0420	
Pariah Village, No. 1...	0·3360	A very foul water.
New Jail, deep well	0·0140	
Do. Garden	0·0140	
Do. (New well in Jail)...	0·0560	
Dr. Pearse's Well	0·0420	

When Cholera occurs does it spread equally over the whole area, or attack certain localities?	Cholera is mainly confined to the ground near the river banks. An old travellers' bungalow, close on the river, was, many years ago, so notorious for the number of persons who were seized with cholera in it, that it was abandoned, and a new bungalow built on higher ground to the south of the town. In a house, belonging to the London Mission Society, on the right bank of the river, two Missionaries have died within a few years, of cholera. A large upstair house, on the left bank of the river, enjoys the unenviable title of "Cholera Hall," owing to the number of native servants, &c., who have died on the grounds. The old Jail in the same locality I have elsewhere spoken of as a cholera haunted building. As the ground rises towards the base of the Shervaroy Hills, the cholera localities get fewer, until the site of the new Jail is reached. Here cholera has only prevailed twice in the ten years of occupation. The plateau of the Shervaroy Hills, not more than ten miles from Salem, and in daily communication with the town, is practically exempt from cholera.
21. *Nature of house accommodation*	
as to (a.) construction, materials, dimensions, &c.	Some of the better class of people have two-storied houses built of brick and chunam, and terraced roofs, but the majority are simply one-storied tiled houses, with mud walls.
(b.) Number of floors.	Usually one, barely raised above the level of the ground.
(c.) Cleanliness...	Average.
(d.) Privy accommodation.	The better class of houses have cess-pit privies in the back-yards. The common houses have often large excavations in the back-yards, made originally to supply the mud for the house walls, which are used for the deposit of house refuse and probably privy filth as well.
(e.) Wells in relation to privies.	The private wells and privies are generally in the same back-yard; often in contiguity.
(f.) Inhabitants crowded or otherwise.	About five or six persons on the average to a house, according to Census. Some quarters of the town appear to be more densely populated than others.
22. *Inspected houses.*	——
Peculiarities?	The old Jail and house known as "Cholera Hall" have damp basements, indicated by the decay of brick-work, mortar, &c., for some distance up the side walls.
Fungi on walls?	——
23. *Age of houses in relation to Cholera*	There is a marked difference in the proportion of cholera attacks in the old Jail building and the new, but this may be a consequence of locality as well as of age of buildings. The town of Salem has extended very much since the beginning of the century, when it came into British possession. There are no very old buildings in the town.
24. *Food of the people.*	Raggy is the principal food grain of the district, but other millets and rice are used also.
25. *Diseases of cereal and other plants before outbreaks of Cholera.*	No information available.

26. *Epizootics* ...	Disease of horned cattle occasionally prevails.
27. *Prevalence of*	
(*a.*) *Fevers* ...	Malarious fevers are the most common diseases of the district.
(*b.*) *Small-pox* ...	Occasionally epidemic.
(*c.*) *Guinea-worm.*	A very common disease in the valleys, but does not prevail on the mountain ranges.
(*d.*) *Parasitic affections of skin or intestines ?*	Nothing unusual.
(*e.*) *Other special diseases.*	None.
28. *Remarks* ...	The sanitary defects of the station as regards conservancy, drainage, and water-supply have been pointed out to the Municipality, and measures are already in progress to remedy them. The Municipal Commissioners contemplate the execution of drainage works for the whole town, and measures are being taken to abolish cess-pit privies, to improve the latrine conservancy, and bring in a supply of water. The sanitary works necessary for the permanent improvement of the health of the town will be costly, and probably beyond the means of the Municipality to accomplish, unaided by the State.

MADRAS,
20*th February* 1871.

(Signed) W. R. CORNISH, F.R.C.S.

ANALYSES OF THE DRINKING WATERS OF PALAVERAM.

No. 1.—Well opposite the Sepoys' Place of Arms.

Colour	None.		
Taste	Do.		
Smell	Do.		
Transparency ...	Transparent.		
Development of organized forms.	None (after forty-eight hours.)		
Reaction to test paper.	Neutral.		
Carbonic Acid ...	Free. ·00440 grammes in a litre.		
Solid matter in one litre. ...	Volatile	·050 grm.	
	Mineral	·560 ,,	
	Total ...	·610	
Oxygen required for organic matter ...	Putrid	·0000750 grm.	
	Decaying readily	·000150 ,,	
	Do. in 24 hours.	·000350 ,,	
Ammonia and organic matter...	Free ammonia	·05 milligramme.	
	Albuminoid	·09 ,,	
Hardness (Clark's scale 1°=1 Grain Calcium Carbonate in one gallon) ...	Removable	6·3°	
	Permanent	8·0°	
	Total ...	14·3°	
Chlorine in one litre	·08496 as chloride of sodium. ·14016 gramme.		
Nitric and Nitrous Acid	Nitrogen estimated as ammonia ·20 = ·742 milligramme.		
Mineral matter ...	Insoluble :		
		Silica and Iron	·002 grm.
		Calcium Carbonate	·128 ,,
		Magnesium	None.
	Soluble :		
		Calcium Sulphate	·1704 grm.
		Magnesium do.	Traces only (?)
		Sodium (as Sulphate)	·0983.
		Sulphuretted Hydrogen	None.
		Phosporic Acid	Present.

No. 2 Well.—Drinking Water behind the Roman Catholic Priest's house.

Colour	Faint blueish (like very dilute milk and water).
Taste	Agreeable.
Smell	Somewhat earthy.
Transparency ...	Not quite transparent, very nearly so.
Development of organized forms.	None.
Reaction	Neutral.

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Carbonic Acid ...	Free ·0077 grms. per litre.	
Solid matter in a litre. ...	Volatile	·050 grm.
	Mineral	·200 „
	Total...	·250 „
		Per litre.
Oxygen required for organic matter...	Putrid	·0000500 grm.
	Decaying readily	·000150 „
	Do. in 24 hours	·000250 „
Ammonia and organic matter. ...	Free ammonia	None.
	Albuminoid	·05 milligramme.
Hardness. ...	Removable	·3°
	Permanent	4·2°
	Total ...	4·5°
Chlorine in one litre ...	·0210 grm.=·0348 sodium chloride.	
Nitric and Nitrous Acids estimated as ammonia ...	·33 mille = 1·13 milligramme nitric acid.	
Mineral matter. ...	Insoluble :	
	Silica and oxide of Iron	·012 grm.
	Calcium carbonate	·008 „
	Magnesium do.	None.
	Soluble :	
	Calcium sulphate	·046 grm.
	Magnesium sulphate	Traces only.
	Sodium sulphate	·087 grm.
	Sulphuretted Hydrogen	None.
	Phosphoric Acid	Not in excess.

No. 3 Well.—Drinking Water, situated in a field.

Colour	None.	
Taste	Not unpleasant.	
Smell	None.	
Transparency ...	Transparent.	
Development of organized forms.	None.	
Reaction to test paper.	Neutral.	
Carbonic Acid ...	Free. ·0044 grm. per litre.	
Solid matter in one litre ...	Volatile	·06 grm.
	Mineral	·31 „
	Total ...	·37 „
Oxygen required for organic matter.	Putrid	·000100
	Decaying readily...	·000200
	Do. in 24 hours	·000450
Ammonia and organic matter ...	Free ammonia	·02 milligramme.
	Albuminoid	·10 „

Hardness. ...	Removable	2·1°
	Permanent	4·2°
	Total ...	6·3°
Chlorine in one litre ...	·0567=·0934 sodium chloride.	
Nitric and Nitrous acid estimated as ammonia ...	·40 mille = 1·48 milligramme nitric acid.	
Mineral matter ...	Insoluble:	
	Silica and Iron	·06 grm.
	Calcium carbonate	·031 ,,
	Magnesium do.	None.
	Soluble:	
	Calcium sulphate	·0571 grm.
	Magnesium do.	Traces.
	Sodium sulphate	·0593 grm.
	Sulphuretted Hydrogen	None.
	Phosphoric Acid	Present, not in excess.

No. 4.—Well No. 1 in front of the Midwifery Ward.

Colour	None.	
Taste	Not unpleasant; slightly brackish.	
Smell	None.	
Transparency ...	Transparent.	
Development of organized forms.	After 48 hours, the more ordinary forms of Volvox and Rotifers.	
Reaction to test paper ...	Faint alkaline, almost neutral.	
Carbonic Acid ...	Free. ·00440 grm.	
Solid matter in one litre ...	Volatile	·060 grm.
	Mineral	·880 ,,
	Total ...	·940
Oxygen required for organic matter.	Putrid	·000050 grm.
	Readily decaying	·00010 ,,
	Decaying in 24 hours	·00020 ,,
Ammonia and organic matter.	Free ammonia	·05 milligramme.
	Albuminoid	·14 ,,
Hardness	Removable	7°·
	Permanent	8°·05
	Total ...	15°·05
Chlorine in one litre	·2380 grm = Sodium Chloride ...	·3944 grm.
Nitric and Nitrous Acids. ...	·72 Milligramme ammonia = Nitric acid 2·59 milligrammes.	

Mineral matter ...	Insoluble:	
	Silica and iron	·003 grm.
	Calcium Carbonate	·144 „
	Magnesium do.	None.
	Soluble:	
	Calcium sulphate	·163
	Magnesium do.	Traces.
	Sodium do.	·1534 grm.
	Sulphuretted Hydrogen	None.
	Phosphoric acid	Not in excess.

Remarks.—Of the four samples of drinking water of this station that have been examined—

No. 1 is a fair sample.

No. 2 is undoubtedly the best, and will bear comparison with the best water of Madras.

No. 3 stands next, except in respect of the "Albuminoid ammonia" being ·02 milligramme higher than the standard of purity (·08 per mille) laid down in Wanklyn and Chapman's book.

No. 4, one of a number of wells situated in front of the European Barracks, is the worst sample, containing much chlorides, deposits a large sediment of carbonates on boiling, consequently unfit for cooking. The figures representing the "Albuminoid ammonia" are high and sufficient to condemn the use of the water for drinking purposes.*

(Signed) R. HARVEY,
Honorary Assistant Surgeon,
Analyst of Potable-waters.

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* The wells near the European Barracks, of which No. 4 is a specimen, are very unequal in quality of water. Only a few of them are used for drinking purposes.—(W. R. C.)

APPENDIX II.

On the alleged Immunity from Cholera of Workers in Gunpowder Factories. By W. R. CORNISH, F.R.C.S., Sanitary Commissioner for Madras.

Some time in the month of July last, when cholera was prevailing in the town of Madras, it was mentioned to me that persons, whose duties led them to handle gunpowder, or the several ingredients employed in its composition, were notoriously exempted from the ordinary epidemic diseases of the country, and especially from cholera. The belief in the preservative action of gunpowder is not confined to the operatives of the Madras factory. It is, according to Colonel R. Cadell, R.A., an accepted belief amongst the artizans in English factories also. In order to test the truth or ortherwise of the theory, Colonel R. Cadell, Superintendent of the powder factory, has obligingly caused the records of his establishment to be carefully searched for a period of twenty years, and the results are shown in the tabulated form below. The records of strength and deaths have been kept with great care, and, except in a few instances where the causes of death were reported as "unknown," are thoroughly reliable. The total of deaths is strictly accurate. Although the statistical evidence does not fully support the view as to the immunity of the employés of the establishment from cholera, neither does it entirely disprove the alleged fact :—

TABLE I.

Mortality for 20 years, Madras Gunpowder Factory.

Classes of Disease.			General Diseases.					Local Diseases.							Injuries.		No appreciable disease.
Orders of Disease.			Sub-Division A.			Sub-Division B.		Nervous system.	Digestive System.			Generative System.		Cutaneous System.	Accidental.		
Years.	Average Strength.	Total Deaths.	Fevers.	Typhoid Fevers.	Cholera.	Phthisis.	Dropsy.	Diseases of the Brain.	Diarrhœa.	Dysentery.	Colic.	Disease of the Generative System.	Child Birth.	Carbuncle.	Killed by explosion.	Sudden Death.	Unknown.
1850	124	6	...	...	1	...	...	...	1	...	...	...	...	...	3	...	1
1851	196	4	1	...	...	1	1	...	...	...	...	...	...	...	...	...	1
1852	197	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
1853	143	7	1	...	1	2	...	1	...	...	...	...	...	...	...	1	1
1854	117	6	...	...	3	1	...	...	...	...	...	...	...	...	...	...	2
1855	116	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
1856	116	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
1857	116	19	...	...	...	...	...	...	...	..	..	...	...	1	17	...	1
1858	193	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
1859	200	2	...	...	1	...	...	...	...	...	...	...	...	...	..	...	...
1860	200	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
1861	211	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
1862	214	3	1	...	1	1	...	...	...	...	1	...	...	...	...	...	...
1863	211	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1864	193	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
1865	177	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
1866	173	3	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...
1867	169	2	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...
1868	163	2	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...
1869	164	3	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Total ...	3,393	70	7	1	12	8	2	1	1	2	1	1	2	1	21	2	8

Ratio per 1,000 of Strength.

CLASSES OF DISEASE.		GENERAL DISEASES.					LOCAL DISEASES.							INJURIES.		No appreciable Disease.
Orders of Disease.		Sub-Division A.			Sub-Division B.		Nervous System.	Digestive System.			Generative System.		Cutaneous System.	Accidental.		
Years.	Total Deaths.	Fevers.	Typhoid Fevers.	Cholera.	Phthisis.	Dropsy.	Diseases of the Brain.	Diarrhœa.	Dysentery.	Colic.	Disease of the Generative System.	Child-birth.	Carbuncle.	Killed by Explosion.	Sudden Death.	Unknown.
1850 ...	49·1	...	0·1	...	...	...	...	8·1	...	...	...	...	...	24·5	...	8·1
1851 ...	20·4	5·1	...	...	5·1	5·1	...	...	...	...	...	...	...	...	...	5·1
1852 ...	10·1	...	...	...	...	...	..	...	...	5·05	...	...	...	...	...	5·05
1853 ...	48·9	6·9	...	6·9	13·9	...	6·9	...	...	...	0·2	...	...	...	6·9	6·9
1854 ...	51·2	...	...	25·5	8·5	...	...	...	...	...	...	...	...	...	...	17·06
1855 ...	17·2	...	...	8·6	8·6	...	..	...	...	...	...	...	...	...	...	...
1856 ...	17·2	...	...	...	...	...	...	...	...	...	...	...	...	...	8·6	8·6
1857 ...	163·7	...	...	...	...	...	...	...	...	...	...	...	8·6	146·5	...	8·6
1858 ...	5·1	...	...	5·1	...	...	...	...	...	...	...	...	...	...	...	...
1859 ...	10·0	...	...	5·0	5·0	...	...	...	...	...	...	..	...	...	...	...
1860 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1861 ...	9·4	...	...	...	4.7	...	...	...	...	...	...	4·7	...	...	...	...
1862 ...	14·01	4·6	...	4·6	...	...	...	...	...	4·6	...	...	...	...	..	...
1863 ...	4·7	...	...	...	4·7	...	...	...	...	...	...		...	...	...	...
1864 ...	5·1	...	...	...	...	...	...	...	...	...	...	...	...	5·1	...	...
1865 ...	11·2	5·6	..	5·6	...	...	...	...	...	...	...	...	...	...	...	...
1866 ...	17·3	11·5	...	5·7	...	...	...	...	...	...	...	...	...	...	...	...
1867 ...	11·8	...	...	5·9	...	...	...	...	5·9	...	...	...	...	...	...	...
1868 ...	12·2	...	...	...	..	...	...	...	6·1	...	..	6·1	...	...	...	...
1869 ...	18·2	60·6	6·06	...	...	6·06	...	...	...	...	...	...	...	...	...	...
Total ...	20·6	2·6	0·2	3 5	2·3	0·5	0·2	0 2	0·5	0·2	0·2	0.5	0·2	6·1	0·5	2·3

In the twenty years to which the Table (I.) refers, there have occurred twelve fatal cases of cholera out of an aggregate strength of 3,393. Fatal cases occurred in ten out of the twenty years, and with the exception of the year 1854, in which three deaths occurred, the mortality has been limited to a single case in each year of cholera prevalence. With the exception of the year 1854, therefore, it is quite clear that cholera could have had no *epidemic* prevalence amongst the people employed in the factory. And as regards 1854, one death occurred on the 9th June, another on 3rd August, and the third on 16th October, proving that cholera was not epidemic amongst the factory hands even in that year.

The years 1860, 1861, 1862, and 1866 were periods of unusual cholera prevalence in Madras, and yet in only two of these years (1862 and 1866) did single cases of cholera affect the employes of the establishment.

It must be remembered that native workers sleep at home nightly, and live at home on Sundays, and that they spend the numerous other holidays allowed to Government servants at home, generally in squalid and unhealthy neighbourhoods where epidemics are rife, and that on all of these days the protective influence (if any) of the gunpowder dust and sulphurous acid fumes would be lost to them, and that they would probably be just as liable as their neighbours to cholera influences, while sleeping and living in localities subject to cholera invasion. The low ratios of mortality from dysentery and diarrhœa are very suggestive.

The table shows that out of an aggregate strength of 3,393 in twenty years, twelve persons died of cholera, or in the ratio of 3·5 per mille. Mr. Balfour in his Statistics of cholera shows that for a period of twenty-four years ending 1868, the Madras Native Army lost at the rate of 4·3 per thousand of mean strength. But the comparison with the Native Army is scarcely a fair one to make, inasmuch as the workers in the Madras gunpowder manufactory, for the most part, live in one of the most unwholesome districts of Madras town, or in the Municipal division which includes Choolay, Pursewalkum, Vepery, &c.,

while Native troops live generally in healthy stations, and are, to some extent, under sanitary supervision in their domestic life.

The population of the suburbs of Madras in which the powder makers live, is known with tolerable accuracy, and sinee the year 1855 the annual eholera mortality of the district has been speeially registered.

The results of the registration in comparison with the mortality of the powder workers is given below.

TABLE II.

Comparison of Ratios of Cholera Mortality per 1,000 of the Population of the 6th Municipal Division and Powder Factory.

6th Municipal Division.	Population.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	Mean of 15 years.
Supposed place of residence of the workmen of the Powder Factory.	41·506	9·2	4·6	6·6	11·08	4·1	8·8	12·2	11·03	6 09	2·9	4·3	15·5	1·1	...	3·4	6·7
Gunpowder Factory Establishment.	174	8·6	...	...	5·1	5·0	...	...	4·6	...	...	5·6	5·7	5·9	...	..	2·6

With referenee to this table, the most notieeable faet is the heavy distriet cholera mortality in 1858, 1860, 1861, 1862, and 1866, and the eomparative freedom of the gunpowder workers during these years. It may be observed, too, that although cholera prevailed in the district during fourteen out of fifteen years, deaths oecurred only in seven years of the fifteen in the gunpowder establishment. While the people of the district were losing 6·7 per thousand every year of their number from cholera, the powder workmen lost only 2·6.

The following table is given to illustrate the liability of the gunpowder factory servants to injuries fatal to life, in eomparison with the Native Army during peaee years:—

TABLE III.

——	Strength.	Deaths from Injuries.	Ratio per 1,000 of Strength.
Native Army (four years)	112,597	17	0·15
Gunpowder Establishment (for twenty years)	3,393	21	6·18

But for the liability to deaths from violenee, the gunpowder workers have an undoubted advantage in regard to prospeets of longevity over the inhabitants of the distriet in which they live.

This will be best seen in the following table eomparing the death ratios from disease and violenee from 1855 to 1869 :—

TABLE IV.

——	Aggregate Population of 15 years.	Deaths.		Ratio per 1,000 of Population, mean of 15 years.	
		From Disease.	From Violence.	From Disease.	From Violence.
6th Municipal Division, supposed residence of the workmen of the Powder Factory	622,590	25,264	132	40·5	0·2
Gunpowder Factory Establishment	2,616	45	18	17·2	6·9

Thus we see that the population of the suburb of Madras, in which the people reside, die at the rate of 40·5 per thousand, while the mortality amongst the powder workers from disease is only 17·2,

The popular idea, in regard to gunpowder workers being specially exempted from contagious disorders fatal to life, being thus in a measure confirmed by statistical data, the question arises—To which ingredient of gunpowder is the protective effect most probably due ?

In the factory, all the ingredients of gunpowder, nitre, sulphur, and charcoal, are separately refined or purified. The nitre of commerce is purified from chlorides and sulphates by solution in water and recrystallisation to the required standard. The sulphur is sublimated or powdered in buildings set apart for the purpose; sulphurous acid is largely disengaged in these rooms, and can be detected in the air of the various apartments, and also of the mixing and granulating rooms. Charcoal is made in the factory with great care in iron retorts. The gaseous products of the distillation of wood pass off without coming into contact with the people. It may be inferred, therefore, that the ingredient which is most cognizable to the senses (sulphur), on account of its liability to oxidation and conversion into sulphurous acid ($S\ O_2$) is the active protective agent, if any, in gunpowder works.

Some of the employés are not, in the course of their ordinary duties, brought into contact with sulphur in its raw or mixed condition, but it would seem from the annexed cholera casualty roll that the persons employed in mixing the materials of gunpowder were not wholly exempted. It is impossible to say, with regard to these deaths, whether the people had, or had not, been regularly at work in the factory before seizure.

Should cholera deaths hereafter occur amongst the servants of the institution, it would be well that a careful account of all the particulars of the cases should at once be placed on record for the benefit of future inquirers. Such a record should show the duties of the person attacked; his days of attendance and periods of absence before the attack; his place of residence and its sanitary condition; and health-state of other persons living in the house or neighbouring houses.

Casualty Roll of Deaths by Cholera among Gunpowder Workers, (20 *years.*)

Occupation.	Names.	Date of Casualties.	Nature of Casualties.
Drying and barrelling man	Mootoo	12th February 1850.	Cholera.
Press and glazing man	Annudary	28th November 1853.	do.
Hammerman	Narasoo	3rd August 1854.	do.
Press and glazing man	Lutchmanan ...	9th June 1854.	do.
Mixer	Lutchmanan ...	16th October 1854.	do.
2nd Peon, Office	Narrainsawmy ...	5th March 1855.	do.
Refining woman	Coopachee	16th April 1858.	do.
Foreman, Corning room	Moonesawmy ...	25th June 1859.	do.
Mixer	Yamooloo	17th do. 1862.	do.
Corner	Seenivasen	28th January 1865.	do.
Do.	Lutchmanan ...	29th July 1866.	do.
Refining woman	Polee	31st January 1867.	do.

[Since this memorandum was drawn up, I have received a return for the Superintendent of the factory for the year 1870, showing that no death from cholera occured amongst the workmen in that year.—W. R. C.]

APPENDIX III.

TABLES SHOWING THE DISTRIBUTION OF CHOLERA FROM 1859-65.

European Army, 1859.

Division.	Station.	Strength.	January.		February.		March.		April.		May.		June.		July.		August.		Septembe.		October.		November.		December.		Total.	
			T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force ...	Kamptee ...	1,031	...	...	...	...	...	...	...	...	...	...	...	...	4	2	1	...	...	...	...	...	...	...	...	...	5	2
Hyderabad Subsidiary Force.	Secunderabad & Trimulgherry	2,551	...	...	...	...	...	...	...	...	1	1	22	10	11	1	24	8	7	2	2	...	...	...	...	...	67	22
	Jaulnah ...	103	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Total ...	2,654	...	...	...	...	...	...	...	...	1	1	24	10	11	1	24	8	7	2	2	...	...	...	...	...	69	22
Ceded District ...	Bellary ...	1,117	*1	*1	10	*6	*1	...	1	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	15	8
Mysore Division.	Bangalore ...	1,611	...	...	...	...	...	...	...	...	9	2	2	1	2	...	...	...	...	...	...	...	...	...	...	...	13	3
	Mysore ...	106	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	1,717	...	...	...	...	...	...	...	...	9	2	2	1	2	...	...	...	...	...	...	...	...	...	...	...	13	3
Malabar and Canara.	Cannanore ...	1,126	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	2	15	3
Centre Division.	St. Thos'. Mount.	637	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Fort St. George (Madras) ...	832	...	...	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	8	4
	Total ...	1,469	...	...	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	8	4
Southern Division.	Trichinopoly ...	601	...	...	1	...	...	...	3	...	1	...	...	...	1	...	1	...	1	...	...	...	1	...	...	...	9	...
	Wellington ...	1,072	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Total ...	1,673	...	...	1	...	1	...	4	...	1	...	...	...	1	...	1	...	1	...	...	...	1	...	...	...	11	...
Northern Division.	Vizagapatam ...	103	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Waltair ...	131	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	234	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Pegue Division...	Rangoon ...	1,279	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...
	Tonghoo ...	783	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moulmain ...	78	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,204	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...
Saugor Field Division.	Saugor ...	1,360	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	3	...
	Banda ...	101	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Jubbulpore ...	650	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nowgong ...	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,186	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	2	...	...	...	...	...	...	...	4	1

* The cholera in the early months of the year at Bellary was a reproduction of a former invasion. The disease lingered in the north-west of the Mysore country from 1857 to 1859.—(W. R. C.)

Native Army, 1859.

Division.	Station.	Strength.	January. T.	January. D.	Feb. T.	Feb. D.	March. T.	March. D	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	Sept. T.	Sept. D.	October T.	October D.	Nov. T.	Nov. D.	Dec. T.	Dec. D.	Total. T.	Total. D.
			Monthly Prevalence of Cholera.																									
Nagpore Force.	Kamptee ...	3,787	...	...	...	...	...	...	...	...	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	3	1
	Hoossungabad ...	1,137	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
	Total ...	4,924	...	...	...	...	...	...	...	...	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	3	1
Hyderabad Subsidiary Force.	Secunderabad ...	3,692	...	...	...	...	...	...	...	...	61	27	52	11	26	3	23	10	24	4	9	1	1	...	1	...	197	56
	Jaulnah ...	1,135	...	...	...	...	...	...	...	...	...	...	13	1	14	...	...	...	1	1	...	...	...	...	...	...	28	2
	Bowenpilly ...	368	...	...	...	...	...	...	...	...	...	...	2	...	...	...	6	3	2	1	...	...	...	...	...	...	10	4
	Camp Hingolee ...	621	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	..	...	...	...	4	...
	Camp Madaveram	1,081	..	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...	...	...	...	15	2	...	...	15	2
	Camp Mackatpully	1,107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...
	Total ...	8,004	...	...	..	...	...	...	..	...	61	27	67	12	40	3	29	13	27	6	13	1	17	2	1	...	255	64
Ceded District.	Bellary * ...	2,473	87	45	38	5	1	...	1	...	...	...	...	...	...	...	2	1	2	...	...	...	...	...	...	...	131	51
	Kurnool ...	877	...	...	...	...	...	...	9	3	16	5	9	6	...	...	...	...	...	...	2	2	3	1	...	...	39	17
	Cuddapah ...	1,129	7	1	7	...	2	...	3	1	3	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	23	3
	Cumbum ...	124	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	1	...
	Total ...	4,603	94	46	45	5	3	...	13	4	20	6	9	6	...	...	2	1	2	...	2	2	3	1	1	...	194	71
Mysore Division	Bangalore ...	1,705	...	...	...	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	3	1
	Hurryhur † ...	869	36	17	12	4	..	...	...	...	...	...	6	3	17	6	5	1	2	1	...	...	...	...	...	...	78	32
	Mercara ...	987	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Manantoddy ...	58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,619	36	17	12	4	1	1	1	...	1	...	6	3	17	6	5	1	2	1	...	...	...	...	...	...	81	33
Malabar & Canara ...	Cannanore ...	1,879	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Mangalore ...	1,811	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...
	Total ...	3,690	1	...	1	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
Centre Division.	Fort Saint George (Madras) ...	1,152	1	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	2
	Perambore ‡ ...	1,045	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vepery ...	651	...	...	...	...	...	...	3	2	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3
	Arcot ...	1,020	7	5	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	6
	Vellore ...	958	16	5	5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	6
	St. Thomas' Mount	319	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram ...	1,248	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Total ...	6,393	24	10	10	4	...	...	4	2	2	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	41	17
Southern Division.	Trichinopoly ...	2,245	48	15	16	3	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	67	18
	Quilon ...	932	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	3	1
	Palamcottah ...	1,173	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	4	...
	Total ...	4,350	50	15	16	3	2	...	...	...	...	...	...	...	...	...	...	...	2	1	3	...	1	...	.	...	74	19
Northern Division	Berhampore § ...	892	...	...	...	...	...	...	13	3	6	1	...	...	...	...	...	...	...	...	..	...	...	...	...	...	19	4
	Masulipatam ...	1,112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	3	1	2	1	...	...	...	...	9	4
	Vizagapatam ...	1,073	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...
	Cuttack ...	1,231	...	...	...	...	...	...			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Russelcondah ...	1,081			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizianagram ...	1,175	...	...	...	..	...	...	...	...	...	...	...	...	1	1	3	1	3	...	1	1	...	...	...	...	8	3
	Dowlaishweram ...	417	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Samulcottah ...	1,119	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	8,100	...	...	...	...	...	...	13	3	6	1	...	...	1	1	8	3	6	1	3	2	...	...	...	...	37	11
Pegue Division.	Rangoon ...	2,849	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	1	1	...	...	3	3
	Meaday ...	701	1	...	10	3	4	3	3	1	...	...	...	...	2	...	2	...	2	...	...	...	...	...	...	...	24	7
	Moulmein ...	1,769	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	2,148	...	...	1	...	7	3	1	...	...	...	5	2	5	...	...	...	...	...	...	...	...	...	1	1	20	6
	Hewzada ...	777	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tonghoo ...	865	...	...	...	...	-	...	...	...	...	...	...	...	...	...	...	...	1	...	2	2	2	...	...	...	5	2
	Shoagheen ...	849	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1
	Pegue Dv. (Various)	575	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...
	Total ...	10,533	2	1	11	3	11	6	4	1	...	...	5	2	8	...	2	...	4	1	4	4	3	1	1	1	55	18
Saugor Field Division.	Saugor ...	1,754	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Banda ...	804	...	...	...	...	...	...	...	...	1	3	7	1	4	...	1	...	1	...	...	...	1	...	...	...	15	4
	Jubbulpore ...	514	...	...	...	...	...	...	...	..	...	...	54	9	...	2	2	...	1	...	...	...	...	..	...	...	57	11
	Nowgong ...	446	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	1	2
	Nagode ...	1,202	...	...	...	...	...	...	1	..	...	...	1	1	...	2	1	...	1	...	...	...	...	...	...	...	4	3
	Marwarah ...	1,003	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Total ...	5,723	...	...	...	...	...	...	1	...	2	4	63	12	5	4	4	...	3	...	...	...	1	...	...	...	79	20

* The January cholera occurred in a Regiment marching from Hurryhur, N. W. Mysore, where the disease had lingered from the former invasion in 1857.

† The new invasion of Hurryhur occurred in June.

‡ The cholera in the Centre and Southern Districts was the remaining of the 1856-57 invasion.

§ Berhampore being close to the endemic field felt the new invasion early.—(W. R. C.)

Jails, 1859.

Division.	Jails.	Average Strength.	Monthly Prevalence of Cholera.																								Total.	
			January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.			
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D
Ceded Districts.	Bellary ...	516	...	...	...	...	...	...	31	6	2	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	35	6
	Cuddapah ...	377	...	...	...	...	13	10	6	3	3	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	23	15
	Kurnool ...	116	...	...	...	...	...	...	5	2	6	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	12	4
	Total ...	1,009	...	...	...	...	13	10	42	11	11	4	1	...	...	...	2	...	...	...	...	...	1	...	...	...	70	25
Malabar & Canara.	Calicut ...	412	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	153	109	18	6	...	...	171	115
	Cannanore ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cochin ...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	190	2	2	...	...	3	2	34	14	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	40	18
	Tellicherry ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Honore ...	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palghaut ...										Returns not available.																	
	Total ...	1,026	2	2	...	..	3	2	34	14	1	...	...	...	...	...	...	...	...	...	153	109	18	6	...	...	211	133
Northern Division.	Masulipatam ...	165	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Rajahmundry...	180	...	...	...	...	...	...	...	...	...	...	...	...	8	5	...	...	...	...	...	...	...	...	...	...	8	5
	Vizagapatam ...	167	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chicacole ...	154	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	1
	Guntoor ...	156	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	822	...	...	...	...	1	1	...	...	...	...	...	...	8	5	...	...	...	...	...	...	1	...	...	1	10	7
Centre Division.	Chingleput ...	278	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chittoor ...	516	...	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	2
	Cuddalore ...	385	25	8	5	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	32	9
	Guindy ...	93	...	...	1	...	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1
	Madras Penitentiary ..	301	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	5	4
	Her M.'s Jail, Madras ...	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nellore ...	333	...	...	...	...	3	2	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	1	6	4
	Total ...	1,954	27	10	10	3	5	2	1	1	...	1	...	...	...	...	1	...	...	...	1	1	1	1	4	1	50	20
Southern Division.	Coimbatore ...	334	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Madura ...	195			34A—15D.						...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*34	15
	Ootacamund ...	55	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Paumben ...	226	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Salem ...	252	6	1	1	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	3
	Tranquebar ...										Returns not available.																	
	Trichinopoly ...	435	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Combaconum ...	219	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tinnevelly ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Negapatam ...										Returns not available.																	
	Total ...	1,984	7	2	2	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	45	20

* Monthly Returns from January to April 1859 are not available. Total admissions and deaths were 34 and 15.

European Army, 1860.

Division.	Stations.	Average Strength.	January. T.	January. D.	February. T.	February. D.	March. T.	March. D.	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	September. T.	September. D.	October. T.	October. D.	November. T.	November. D.	December. T.	December. D.	Total. T.	Total. D.
Nagpore Force ...	Kamptee ...	984	...	...	2	1	10	5	15	3	8	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	36	12
Hyderabad Subsidiary Force.	Trimulgherry & Secunderabad.	2,873	...	...	...	...	1	...	8	1	5	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	16	4
	Jaulnah ...	278	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Troops marching from Whitlock's Column ...	85	...	...	11	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	4
	Total ...	3,236	...	...	11	4	2	...	10	1	5	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	30	8
Ceded Districts...	Bellary ...	1,058	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...
Mysore Division.	Bangalore ...	1,351	...	...	...	...	...	...	...	...	...	...	...	...	9	7	13	4	...	...	...	...	...	...	...	...	22	11
Malabar and Canara.	Cannanore ...	1,085	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Centre Division.	Fort St. George (Madras) ...	935	...	...	...	...	*7	*4	*1	...	...	...	...	...	3	1	5	3	...	...	1	...	1	...	...	...	18	8
	St. Thos'. Mount.	666	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	1	1	...	...	...	...	3	2
	Total ...	1,601	...	...	...	...	7	4	1	...	...	...	...	...	4	2	6	3	...	...	2	1	1	...	...	...	21	10
Southern Divn.	Trichinopoly ...	558	...	...	...	...	...	...	...	...	...	...	...	...	4	1	...	...	...	...	...	...	...	...	...	...	4	1
	Wellington ...	998	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	2	...
	Total ...	1,556	...	...	...	...	...	...	...	...	...	...	...	...	6	1	...	...	...	...	...	...	...	...	...	...	6	1
Northern Divn.	Vizagapatam ...	93	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Waltair ...	179	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Total ..	272	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...
Pegu Division.	Rangoon ...	1,354	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	4	...	...	7	4
	Tongboo ...	709	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1
	Pegu Division (various.)	224	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,287	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	5	...	...	8	5

* These cases occurred in a Corps just landed from Calcutta. The epidemic invasion did not reach Madras until June.—(W. R. C.)

Native Army, 1860.

Division.	Station.	Strength.	January. T.	January. D.	February. T.	February. D.	March. T.	March. D.	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	September. T.	September. D.	October. T.	October. D.	November. T.	November. D.	December. T.	December. D.	Total. T.	Total. D.
Nagpore Force	Kamptee ...	3,488	1	1	18	3	68	25	35	8	7	2	1	1	5	1	8	1	2	1	...	...	...	...	...	...	145	43
	Hoossungabad...	789	...	...	...	...	9	3	12	3	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	7
	Total ...	4,277	1	1	18	3	77	28	47	11	10	3	1	1	5	1	8	1	2	1	...	...	...	...	...	...	169	50
Hyderabad Subsidiary Force.	Secunderabad...	3,473	...	...	10	5	1	...	1	...	1	1	7	3	6	2	1	...	...	...	1	...	1	...	...	...	29	11
	Jaulnah ...	1,170	...	...	...	...	..	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	3	...
	Bowenpilly ...	349	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Camp Kallaroo.	984	...	...	1	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Camp Masulapooram ...	386	...	...	...	...	21	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	3
	Camp Vandeapoor ...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	...	2	...
	Total ...	6,362	...	...	11	5	22	3	3	...	1	1	7	3	9	2	1	...	...	...	1	...	1	...	...	...	56	14
Ceded District	Bellary ...	2,073	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool ...	691	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	...	...	..	...	4	2
	Cuddapah ...	818	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
	Cumbum ...	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	...	.	...	...	4	2
Mysore Division.	Bangalore ...	2,359	...	...	...	...	...	..	...	...	1	...	1	...	13	4	30	10	2	...	...	...	...	...	...	...	47	14
	Hurryhur ...	737	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mercara ...	767	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	4	2
	French Rocks ...	499	...	...	...	...	..	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
	Total ...	4,362	...	...	...	...	...	...	...	...	1	...	1	..	13	4	30	10	2	...	...	...	...	...	4	2	51	16
Malabar and Canara.	Cannanore ...	1,652	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	1,525	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Wynaad ...	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,264	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Centre Division.	Fort St. George (Madras) ...	1,342	...	...	...	...	...	...	...	...	2	...	2	...	5	2	2	1	...	...	...	...	..	...	...	...	11	3
	Perambore ...	1,377	...	...	...	...	2	2	...	...	...	...	1	...	8	3	...	...	...	...	...	...	...	...	...	...	11	5
	Vellore ...	1,513	...	...	...	...	...	...	...	...	...	...	...	...	7	6	2	...	...	...	1	...	2	...	...	...	12	6
	St. Thos'. Mount	340	...	...	...	...	...	...	...	...	...	...	...	...	3	1	1	1	...	...	...	...	...	...	...	...	4	2
	Palaveram ...	566	...	...	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	5,138	...	...	...	...	2	2	...	...	2	...	3	...	23	12	5	2	...	...	1	...	2	...	...	...	38	16
Southern Division.	Trichinopoly ...	2,137	1	...	...	...	...	...	9	4	2	...	...	...	6	5	1	1	...	...	...	...	1	1	22	17	42	28
	Quilon ...	740	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Palamcottah ...	715	2	...	1	...	...	..	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	3	...
	Paumbem ...	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	..	...	1	...	2	...
	Sukuragudy in Palamcottah ..	413	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Negapatam ...	1,020	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
	Total ...	5,051	3	...	2	1	...	...	9	4	3	...	...	...	6	5	1	1	...	...	1	...	1	1	23	17	49	29
Northern Division.	Cuttack ...	828	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizianagram ...	1,629	...	..	...	...	2	1	1	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	5	3
	Berhampore ...	799	...	...	...	...	...	...	...	...	...	...	...	...	20	6	7	3	...	...	...	...	.	...	...	...	27	9
	Masulipatam ...	732	...	...	...	...	10	...	...	...	...	..	...	...	...	...	1	1	...	...	...	...	...	...	...	...	11	1
	Vizagapatam ...	785	...	..	.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cocanada ...	1,037	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...
	Samulcottah ...	8[illegible]2	...	...	...	...	3	...	2	...	1	...	1	...	...	..	...	...	...	...	...	...	...	...	...	...	7	...
	Dowlaishweram.	28[illegible]	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	6,919	...	...	...	...	15	1	3	...	2	1	1	...	21	7	8	4	...	...	...	...	...	...	...	...	50	13
Pegue Division.	Tonghoo ...	1,066	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Meaday ...	925	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2	1	1	...	4	2
	Rangoon ...	2,334	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	2	1
	Thayetmyoo ...	1,619	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hewzada ...	650	...	...	...	...	1	1	2	1	5	1	2	...	1	...	1	...	...	...	...	...	...	...	...	...	12	3
	Moulmein ...	1,738	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Shoagheen ...	847	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Pegue Division (various). ...	283	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	9,518	..	...	...	...	1	1	2	1	5	1	2	...	1	...	2	1	...	...	...	...	3	1	2	1	18	6

Jails, 1860.

Division.	Jails.	Average Strength.	January. A.	January. D.	February. A.	February. D.	March. A.	March. D.	April. A.	April. D.	May. A.	May. D.	June. A.	June. D.	July. A.	July. D.	August. A.	August. D.	September. A.	September. D.	October. A.	October. D.	November. A.	November. D.	December. A.	December. D.	Total. A.	Total. D.
Ceded Districts.	Bellary ...	433	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddapah ...	320	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool ...	126	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	2	1
	Total ...	879	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	2	1
Malabar and Canara.	Calicut ...	348	1	1	9	2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	11	4
	Cannanore ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cochin ...	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	213	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Tellicherry ...	112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Honore ...	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	934	2	1	9	2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	12	4
Northern Divn.	Masulipatam ...	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rajahmundry ...	158	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	152	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chicacole ...	143	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	553	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Centre Divn.	Chingleput ...	247	...	...	...	...	...	...	...	...	...	...	2	2	2	...	3	1	...	...	...	...	...	...	...	...	7	3
	Chittoor ...	613	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...
	Cuddalore ...	326	...	...	...	...	...	...	...	...	...	...	...	...	7	2	...	...	1	...	...	...	...	...	...	...	8	2
	Guindy ...	51	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	2	1
	Madras Penitentiary ...	290	...	...	...	...	...	...	...	...	...	...	...	...	37	13	...	...	...	...	...	...	...	...	...	...	37	13
	Her Majesty's Jail, Madras...	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore* ...	180	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...
	Total ...	1,737	...	...	...	...	...	...	...	...	...	...	3	3	49	15	3	1	1	...	...	...	...	...	...	...	56	19
Southern Divn.	Coimbatore ...	269	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	13	6	4	1	18	7
	Madura ...	182	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	...	...	...	1	1	...	...	3	3	7	6
	Ootacamund ...	97	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Paumben ...	177	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Salem ...	261	...	...	1	...	...	...	...	...	10	5	1	1	2	2	1	...	...	...	...	...	...	...	3	2	18	10
	Tranquebar ...		Returns not available.																									
	Trichinopoly ...	422	...	...	...	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	...	...	...	...	...	...	3	1
	Combaconum ...	129	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	1	...	1	...	4	1
	Tinnevelly ...	179	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	4	1
	Paulghaut ...	76	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	1,792	1	...	4	1	...	...	...	...	10	5	6	3	4	4	3	...	...	...	2	1	15	7	11	6	56	27

* For seven months only.

European Army, 1861.

Division.	Stations.	Average Strength.	Monthly Prevalence of Cholera.																									
			January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force ...	Kamptee ...	1,265	...	...	...	...	6	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...
Hyderabad Subsidiary Force.	Secunderabad & Trimulgherry.	3,037	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jaulnah... ...	308	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,345	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ceded Districts ...	Bellary... ...	993	...	...	...	...	...	...	...	...	...	...	2	1	2	...	2	1	...	...	...	...	...	...	...	...	6	2
Mysore Division.	Bangalore ...	1,648	10	3	5	2	12	5	16	7	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	45	17
	Cannanore ...	990	...	...	...	...	...	...	...	...	...	...	2	2	4	...	6	2	...	...	1	1	1	...	...	...	14	5
	French Rocks ...	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,754	10	3	5	2	12	5	16	7	2	...	2	2	4	...	6	2	...	...	1	1	1	...	...	...	59	22
Presidency Divn.	Fort St. George (Madras) ...	881	...	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1
	St. Thos.' Mount.	696	2	...	2	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	5	1
	Total...	1,577	2	...	2	...	...	...	...	...	3	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	8	2
Southern Divn.	Trichinopoly ...	737	1	1	...	...	...	...	...	...	...	...	4	2	6	3	1	...	...	...	...	...	...	...	...	...	12	6
	Wellington ...	961	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Total ...	1,698	1	1	...	...	...	...	...	...	1	1	4	2	6	3	1	...	...	...	...	...	...	...	...	...	13	7
Northern Divn.	Vizagapatam ...	75	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Waltair ...	168	...	...	...	...	...	...	...	...	...	...	5	3	2	...	...	...	...	...	...	...	...	...	...	...	7	3
	Total ...	243	...	...	...	...	...	...	...	...	...	...	6	4	2	...	...	...	...	...	...	...	...	...	...	...	8	4
Pegu Division ...	Rangoon ...	1,174	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Thayetmyoo ...	118	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tonghoo ...	1,019	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	6	...
	Moulmein ...	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,418	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	7	1

Native Army, 1861.

Division.	Stations.	Strength.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force...	Kamptee ...	2,635	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hooshungabad ...	667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seroncha ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,406	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hyderabad Subsidiary Force...	Secunderabad ...	2,908	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	1
	Jaulnah ...	698	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bowenpilly ...	284	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,890	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	1
Ceded Districts..	Bellary ...	1,742	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool ...	641	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	1	...	...	...	1	...	...	...	4	1
	Cuddapah ...	564	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,947	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	1	...	...	...	1	...	...	...	4	1
Mysore Division.	Bangalore ...	2,544	...	...	...	...	1	1	4	2	4	1	...	...	1	1	1	...	...	...	...	...	...	...	...	...	11	5
	Luckadi ...	69	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	French Rocks ...	475	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Hurryhur ...	672	...	...	...	...	...	...	4	2	16	6	2	1	...	...	...	...	...	...	...	...	...	...	...	...	22	9
	Mercara ...	684	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	1 405	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore ...	1,407	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	7,256	...	...	...	...	1	1	8	4	21	8	2	1	1	1	1	...	...	...	...	...	...	...	...	...	34	15
Centre Division.	Fort Saint George (Madras) ...	2,040	...	...	...	...	1	...	1	...	1	...	...	...	1	1	2	1	2	...	3	1	...	...	...	...	11	3
	St. Thomas' Mount	313	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram ...	718	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1
	Arcot ...	505	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
	Vellore ...	1,098	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	2	1	...	...	4	2
	Total...	4,674	...	...	...	...	1	...	2	...	1	...	...	...	2	2	2	1	3	1	3	1	2	1	1	...	17	6
Southern Division ...	Trichinopoly ...	1,943	6	2	9	2	...	...	...	...	...	...	3	3	7	3	3	...	...	...	...	...	5	4	12	3	45	17
	Palamcottah ...	708	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Quilon... ...	678	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Paumbem ...	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,349	6	2	9	2	...	...	...	...	...	...	3	3	7	3	3	...	...	...	...	...	5	4	12	3	45	17
Northern Division ...	Waltair ...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuttack ...	743	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...
	Elloro	214	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Berhampore ...	691	...	...	...	...	...	...	...	...	7	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	10	2
	Masulipatam ...	636	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Samulcottah ...	698	...	...	...	...	...	...	...	...	1	...	1	...	3	...	2	...	...	...	1	...	...	...	...	...	8	...
	Vizianagram ...	1,769	...	...	...	...	...	...	...	...	5	2	1	...	20	7	5	1	...	...	...	...	...	...	1	...	32	10
	Vizagapatam ...	661	...	...	...	...	...	...	...	...	...	...	3	...	10	1	...	...	...	...	...	...	...	...	...	...	13	1
	Dowlaishweram...	404	...	...	...	...	...	...	...	...	2	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	5	...
	Chicacole ...	769	...	...	...	...	...	...	...	...	...	...	6	2	6	2	4	1	1	...	1	...	1	...	1	...	20	5
	Total...	6,616	...	...	...	...	...	...	...	...	15	4	16	2	40	10	11	2	2	...	2	...	1	...	2	...	89	18
Pegu Division...	Tonghoo ...	951	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	1,596	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rangoon ...	1,789	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1
	Moulmein ...	973	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1
	Meaday ...	938	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Shoaygheen ...	1,024	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Pegu Division (various) ...	162	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	7,433	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	2	2

Jails, 1861.

Division.	Jails.	Average Strength.	Monthly Prevalence of Cholera.																									
			January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Ceded Districts.	Bellary... ...	400	...	...	...	...	...	...	...	...	...	...	...	...	1	1	4	3	3	1	...	...	...	...	...	...	8	5
	Cuddapah ...	364	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	4	3	...	...	...	...	9	4
	Kurnool ...	147	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	911	...	...	...	...	...	...	...	...	...	...	...	...	1	1	4	3	8	2	4	3	...	...	...	...	17	9
Malabar and Canara.	Calicut... ...	392	...	...	...	...	...	...	...	...	...	...	7	5	7	3	11	5	11	5	17	15	...	...	...	...	53	33
	Cannanore ...	72	...	...	...	...	...	...	...	...	7	3	1	2	...	...	1	1	1	...	...	...	...	...	...	...	10	6
	Cochin	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	237	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tellicherry ...	121	...	...	...	...	...	...	...	...	...	...	1	1	2	1	9	7	...	...	...	1	...	...	...	...	12	10
	Honore ...	161	...	...	...	...	...	...	...	...	...	...	...	...	4	3	5	2	...	...	...	...	...	...	...	...	9	5
	Total ...	1,023	...	...	...	...	...	...	...	...	7	3	9	8	13	7	26	15	12	5	17	16	...	...	...	...	84	54
Northern Divn.	Masulipatam ...	84	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rajahmundry ...	153	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	148	...	...	...	...	...	...	1	...	...	...	31	20	6	4	...	...	...	...	...	...	...	...	...	...	38	24
	Chicacole ...	166	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Guntoor ...	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	706	...	...	...	...	...	...	1	...	...	...	31	20	6	4	...	...	...	...	...	...	...	...	...	...	38	24
Centre Divn...	Chingleput ...	324	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chittoor ...	694	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	38	16	40	17
	Cuddalore ...	395	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	3	...
	Guindy ...	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Madras Penitentiary ...	361	...	...	...	...	...	...	1	1	...	...	...	...	4	3	...	...	3	3	...	...	...	...	...	...	8	7
	Her Majesty's Jail, Madras...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nellore ...	290	...	...	...	...	...	...	76	39	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	80	41
	Vellore ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,370	...	...	...	...	...	...	77	40	4	2	...	...	4	3	2	...	5	4	1	...	...	...	38	16	131	65
Southern Divn.	Coimbatore ...	354	...	1	...	...	...	...	...	...	5	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	6	3
	Madura. ...	203	4	4	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	7	4
	Ootacamund ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Paumben ...	137	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	4	...
	Salem ...	365	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1
	Tanjore ...	93	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Tranquebar ...	89	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1
	Trichinopoly ...	352	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...
	Combaconum ...	111	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tinnevelly ...	188	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,028	4	5	...	...	3	...	1	...	5	2	1	...	1	1	...	...	1	...	2	1	...	...	6	...	24	9

European Army, 1862.

Division.	Stations.	Strength.	January. T.	January. D.	February. T.	February. D.	March. T.	March. D.	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	September. T.	September. D.	October. T.	October. D.	November. T.	November. D.	December. T.	December. D.	Total. T.	Total. D.
Nagpore Force ...	Kamptee ...	1,161	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	10	3	2	...	...	...	...	14	12
Hyderabad Subsidiary Force.	Secunderabad & Trimulgherry.	3,043	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	1	1	...	1	...	...	...	...	...	5	2
	Jaulnah ...	308	...	...	...	..	2	1	2	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	7	1
	Total...	3,351	...	...	...	...	2	1	2	...	1	...	1	...	1	1	2	1	1	...	2	...	...	...	...	...	12	3
Ceded Districts ...	Bellary... ...	1,116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...	3	1
Mysore Division.	Bangalore ...	1,498	...	...	...	...	...	...	1	...	1	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	4	2
Malabar & Canara.	Cannanore ...	1,129	...	...	...	...	...	...	1	...	2	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	5	2
	Total...	2,627	...	...	...	...	...	...	2	...	3	2	4	2	...	...	...	...	...	...	...	...	...	...	...	...	9	4
Presidency Divn.	Fort St. George (Madras) ...	789	...	...	...	...	...	...	...	...	...	...	4	3	1	...	...	...	1	1	...	...	...	...	2	1	8	5
	St. Thos'. Mount.	693	1	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	5	1
	Total...	1,482	1	...	2	1	1	...	...	...	...	...	4	3	1	...	...	...	1	1	...	...	...	...	3	1	13	6
Southern Divn.	Trichinopoly ...	632	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Wellington ...	199	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	831	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northern Divn.	Vizagapatam ...	62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Waltair... ...	137	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
	Dowlaishweram.	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	216	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pegu Division.	Rangoon ...	1,046	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	635	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1
	Tonghoo ...	520	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,201	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1

Native Army, 1862.

Division.	Stations.	Strength.	Monthly Prevalence of Cholera.																									
			January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force...	Kamptee ...	2,231	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2	23	6	4	3	1	...	...	...	31	11
	Hooshungabad...	673	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seroncha ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	3	...	...	...	...	...	...	...	...	7	3
	Total...	3,013	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	5	23	6	4	3	1	...	...	...	38	14
Hyderabad Subsidiary Force.	Secunderabad ...	2,711	1	...	...	...	1	...	...	...	...	...	14	6	20	7	5	2	1	...	...	...	...	...	...	...	42	15
	Bowenpilly ...	310	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jaulnah ...	705	1	1	...	...	...	...	...	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	4	2
	Total...	3,726	2	1	...	...	1	...	...	...	1	1	15	6	21	7	5	2	1	...	...	...	...	...	...	...	46	17
Ceded Districts.	Bellary ...	1,814	...	...	...	...	...	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Kurnool ...	690	...	...	...	...	...	...	...	...	...	...	6	3	10	5	1	...	...	...	...	...	...	...	...	...	17	8
	Cuddapah ...	689	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	1	...	...	3	1
	Total...	3,193	...	...	...	...	...	...	1	1	...	...	7	4	10	5	2	...	1	...	...	...	1	1	...	...	22	11
Mysore Division.	Bangalore ...	2,398	...	...	...	...	...	...	3	3	...	...	1	1	2	1	...	...	...	...	2	1	1	...	...	...	9	6
	Cannanore ...	1,434	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1
	Mangalore ...	891	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Luckadi ...	174	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	French Rocks ...	656	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hurryhur ...	666	...	...	...	...	...	...	1	...	1	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	5	1
	Mercara ...	609	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	6,828	...	...	...	...	...	...	4	3	1	...	1	1	5	3	1	...	...	...	2	1	1	...	...	...	15	8
Centre Division.	Fort St. George (Madras) ...	2,020	...	...	...	...	1	...	...	...	...	...	22	7	1	1	...	...	1	...	1	1	4	...	3	1	33	10
	Vellore ...	901	9	5	3	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	14	8
	Arcot ...	569	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1
	Palaveram ...	367	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	1	...	2	...	1	...	6	...
	St. Thomas' Mount	370	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	4,227	12	6	3	1	1	...	...	...	1	..	23	7	1	1	1	1	1	...	2	1	6	...	5	2	56	19
Southern Divn.	Trichinopoly ...	1,686	3	1	5	1	1	1	1	1	...	...	...	...	...	...	...	...	...	...	12	7	...	...	16	3	38	14
	Quilon ...	504	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palamcottah ...	671	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1
	Paumben ...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,879	5	2	5	1	1	1	1	1	...	...	...	...	...	...	...	...	...	...	12	7	...	...	16	3	40	15
Northern Divn.	Waltair ...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuttack ...	837	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Berhampore ...	891	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1
	Vizianagram ...	1,480	...	...	...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	2	1	...	...	6	1
	Vizagapatam ...	721	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Masulipatam ...	715	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Dowlaishweram.	167	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ..	4,829	...	...	...	...	2	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	2	1	1	1	8	2
Pegu Division...	Tonghoo ...	679	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	859	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rangoon ...	776	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moulmein ...	979	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Pegu Division (various) ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,331	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Jails, 1862.

Division.	Jails.	Average Strength.	January. A.	January. D.	February. A.	February. D.	March. A.	March. D.	April. A.	April. D.	May. A.	May. D.	June. A.	June. D.	July. A.	July. D.	August. A.	August. D.	September. A.	September. D.	October. A.	October. D.	November. A.	November. D.	December. A.	December. D.	Total. A.	Total. D.
			Monthly Prevalence of Cholera.																									
Ceded Districts.	Bellary ...	528	...	...	...	...	...	...	...	...	...	...	2	2	7	1	...	...	...	...	...	...	...	...	...	...	9	3
	Cuddapah ...	473	...	...	...	...	...	...	...	...	...	...	...	...	4	3	...	...	...	...	...	...	...	...	...	...	4	3
	Kurnool ...	176	...	...	...	...	...	...	...	...	2	2	2	...	2	2	...	...	1	1	...	...	...	...	...	...	7	5
	Total ...	1,177	...	...	...	...	...	...	...	...	2	2	4	2	13	6	...	...	1	1	...	...	...	...	...	...	20	11
Malabar and Canara.	Calicut ...	433	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore ...	...									Returns not available.										–	...	...	...	...	...	...	...
	Cochin ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	228	...	...	...	.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tellicherry ...	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	854	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northern Divn.	Masulipatam ...	108	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	.	...	...	...	...	...	...	...
	Rajahmundry ...	210	...	–	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	214	1	1	4	3	7	6	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	11
	Chicacole ...	211	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	2	2	4	4
	Guntoor ...	194	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	937	1	1	4	3	7	6	...	...	1	1	...	..	...	...	...	...	...	...	1	1	1	1	2	2	17	15
Centre Divn.	Chingleput ...	390	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Chittoor ...	637	8	1	1	1	1	2	...	...	...	...	..	...	...	...	...	..	...	...	...	...	...	...	...	...	10	4
	Cuddalore ...	336	24	8	18	10	5	...	5	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	53	20
	Guindy ...	107	...	...	...	...	...	...	1	1	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Madras Penitentiary ...	372	...	...	...	...	2	1	...	...	...	...	–	...	1	1	1	...	...	1	...	...	...	...	3	1	7	4
	H.M.'s Jail, Madras	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nellore ...	329	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
	Total ...	2,197	32	9	20	12	8	3	6	3	...	...	1	..	1	1	1	..	..	1	...	...	...	...	3	1	72	30
Southern Divn.	Coimbatore ...	476	...	...	...	...	7	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	4
	Madura ...	251	7	4	4	2	4	3	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	19	11
	Ootacamund ...	133	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...
	Paumbem ...	154	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Salem ...	517	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...
	Tanjore ...	104	...	–	...	...	...	...	...	...	1	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	1	...
	Tranquebar ...	156	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Trichinopoly ...	383	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	1
	Combaconum ...	70	...	...	5	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3
	Tinnevelly ...	189	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,433	8	4	9	5	12	7	2	1	1	...	1	1	...	...	1	...	...	...	...	...	1	1	4	1	39	20

European Army, 1863.

Division.	Stations.	Strength.	January. T.	January. D.	February. T.	February. D.	March. T.	March. D.	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	September. T.	September. D.	October. T.	October. D.	November. T.	November. D.	December. T.	December. D.	Total. T.	Total. D.
			Monthly Prevalence of Cholera.																									
Nagpore Force.	Kampteo ...	1,112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1
	Chindwarrah ...	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seetabuldee ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,246	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1
Hyderabad Subsidiary Force.	Secunderabad & Trimulgherry	2,381	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Ceded Districts..	Bellary... ...	995	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	...	3	.	...	...	6	1
Mysore Division...	Bangalore ...	2,129	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	...	...	...	...	2	2
Malabar and Canara ...	Cannanore ...	556	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut	78	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Malliapoorum ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,896	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	...	...	...	...	2	2
Centre Divn ...	Fort St. George (Madras) ...	898	1	1	2	2	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	6
	St. Tho.s' Mount	631	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Palaveram ...	158	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Poonamallee ...	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,878	1	1	2	2	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	8
Southern Divn.	Trichinopoly ...	252	1	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	4	4
	Wellington ...	526	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	778	1	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	4	4
Northern Divn.	Vizagapatam ...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Waltair ...	126	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Dowlaishweram.	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Masulipatam ...	32	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Total...	189	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Pegu Division.	Rangoon ...	1,073	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyo * ...	606	1	1	...	...	3	1	22	15	9	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35	21
	Tonghoo ...	471	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,150	1	1	...	...	3	1	22	15	9	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35	21

* The cholera at Thayetmyoo in this year was that of a new invasion to the south-east of the endemic field.—(W. R. C.)

Native Army, 1863.

Division.	Stations.	Strength.	Monthly Prevalence of Cholera. January.		February.		March.		April.		May.		June.		July.		August.		September.		October		November.		December.		Total.	
			T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force...	Kamptee ...	1,496	...	...	...	...	...	...	...	...	...	...	...	...	5	2	15	6	21	6	49	24	7	2	...	...	97	40
	Hooshungabad..	703	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Raepore ...	386	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moothoor ...	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seetabuldee ...	408	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,089	...	...	...	...	...	...	...	...	...	...	...	...	5	2	15	6	21	6	49	24	7	2	...	...	97	40
Hyderabad Sub-sidiary Force.	Secunderabad...	2,321	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bowenpilly ...	378	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jaulnah ...	344	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,043	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ceded Districts...	Bellary... ...	1,574	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Cuddapah ...	676	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1
	Kurnool ...	710	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1
	Total...	2,960	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	3	3
Mysore Division.	Bangalore ...	2,203	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	1	...	...	...	...	4	2
	Cannanore ...	1,044	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Luckadi ...	203	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	French Rocks...	603	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	662	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hurryhur ...	692	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mercara ...	587	...	...	...	...	...	...	1	1	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2
	Total...	5,994	1	1	...	...	1	1	1	1	3	1	...	...	...	...	...	...	1	...	2	1	...	...	...	...	9	5
Centre Division...	Fort St. George (Madras) ...	2,211	...	...	3	...	10	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	1
	St. Tho.s' Mount,	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1
	Palaveram ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Arcot	665	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore ...	741	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...	2	2
	Total...	3,974	...	...	3	...	10	...	...	...	...	1	...	...	...	...	...	...	...	...	2	2	...	...	1	1	16	4
Southern Divn...	Trichinopoly ...	2,189	16	9	6	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	25	16	49	29
	Quilon ..	632	...	...	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1
	Palamcottah ...	696	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Paumben ...	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,533	16	9	6	2	...	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	2	2	25	16	52	30
Northern Divn...	Cuttack ...	807	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Berhampore ...	844	...	...	...	...	...	...	...	...	...	...	9	3	...	...	...	...	...	...	...	...	...	...	...	...	9	3
	Vizianagram ...	1,437	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	789	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Masulipatam ...	713	...	...	...	...	...	...	...	...	2	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	3	2
	Dowlaishweram,	415	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Waltair ...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Ellore ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rajahmundry ...	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	5,076	...	...	...	...	...	...	...	...	2	1	9	3	1	1	...	...	...	...	...	...	...	...	...	...	12	5
Pegu Division ...	Tonghoo ...	577	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	699	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moulmein ...	734	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rangoon ...	727	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,737	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Jails, 1863.

Division.	Jails.	Average Strength.	January. A.	January. D.	February. A.	February. D.	March. A.	March. D	April. A.	April. D.	May. A.	May. D.	June. A.	June. D.	July. A.	July. D.	August. A.	August. D.	September. A	September. D.	October. A.	October. D	November. A.	November. D.	December. A.	December. D.	Total. A.	Total. D.
Ceded Districts.	Bellary ...	517	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Cuddapah ...	540	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1
	Kurnool ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	4	...
	Total...	1,241	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	3	1	...	...	2	...	...	...	6	1
Malabar and Canara.	Calicut ...	366	...	...	...	...	136	88	5	3	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	142	91
	Cannanore ...		Returns not available.																									
	Cochin ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tellicherry ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	814	...	...	...	...	136	88	5	3	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	142	91
Northern Divn.	Masulipatam ..	147	...	...	...	...	...	...	...	...	3	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	4	...
	Rajahmundry ...	154	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	239	...	...	...	...	...	...	...	...	...	...	7	3	...	...	...	...	...	...	...	...	...	...	...	...	7	3
	Chicacole ...	271	...	...	...	...	...	...	...	...	2	1	1	...	10	6	...	...	...	...	...	...	...	...	...	...	13	7
	Total...	811	...	...	...	...	...	...	...	...	5	1	8	3	10	6	1	...	...	...	...	...	...	...	...	...	24	10
Centre Division.	Guntoor ...	206	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	13	8	...	...	...	...	...	...	17	9
	Chingleput ...	366	1	...	20	8	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	26	10
	Chittoor ...	546	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddalore ...	392	6	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	4	...	...	...	...	...	46	20	58	21
	Guindy ...	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Madras Penitentiary ...	344	9	4	2	2	31	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42	17
	Her Majesty's Jail, Madras...	76	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nellore ...	400	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,426	16	5	22	10	36	13	...	...	...	...	...	...	...	...	6	1	17	8	...	...	...	...	46	20	143	57
Southern Divn.	Coimbatore ...	435	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25	15	27	17
	Madura ...	277	1	1	2	1	2	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	4
	Paumbem ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Salem ...	512	1	...	...	...	21	7	58	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	80	39
	Tranquebar ...	198	5	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3
	Trichinopoly ...	419	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2	1	1	6	4
	Combaconum ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tinnevelly ...	237	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Ootacamund (European) ...	42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Ootacamund (Native) ...	117	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	2,554	9	5	2	1	25	11	59	32	...	...	...	...	...	...	...	...	...	...	...	...	3	2	26	16	124	67

Monthly Prevalence of Cholera.

European Army, 1864.

Division.	Stations.	Strength.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force.	Kamptee ...	1,239	7	5	...	...	...	...	13	6	8	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	29	13
	Chindwarrah ...	58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seetabuldee ...	49	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,346	7	5	...	...	...	...	13	6	8	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	29	13
Hyderabad Subsidiary Force.	Secunderabad & Trimulgherry.	2,586	...	...	1	...	1	...	...	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...	...	4	2
Ceded Districts.	Bellary ...	1,202	5	...	8	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29*	...
	Ramandroog ...	46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,248	5	...	8	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	...
Mysore Divn..	Bangalore ...	2,244	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Cannanore ...	691	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Malliapoorum...	144	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	3,159	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Presidency Divn.	Fort St. George (Madras) ...	890	...	...	8	2	2	2	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	†6
	St. Tho.'s Mount.	465	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram ...	140	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Poonamallee ...	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore, G H....	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Guindy, Camp of H. M.'s 74th Regiment ...	106	...	...	15	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	‡7
	Total...	1,791	...	...	23	9	2	2	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	28	13
Southern Divn...	Trichinopoly ...	269	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Wellington ...	610	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	879	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Northern Divn.	Vizagapatam ...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Waltair ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Dowlaishweram.	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Masulipatam ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peju Division.	Rangoon ...	868	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	613	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tonghoo ...	461	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2
	Shaygheen ...	492	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Total...	2,434	3	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3

* Entered as Cholera Biliosa.

† This was an introduced cholera due to the arrival of a Corps that had been struck with cholera *en route.*

‡ The Corps got cholera in marching down to Madras from Bellary.—(W. R. C.)

Native Army, 1864.

Division.	Stations.	Strength.	Monthly Prevalence of Cholera.																									
			January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			T.	D.	T.	D	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Nagpore Force.	Kamptee	1,446	...	...	13	4	2	1	14	5	20	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	49	16
	Hooshungabad.	358	...	...	...	...	...	...	...	...	1	1	10	4	2	...	...	...	...	...	...	...	...	...	...	...	13	5
	Raepore	658	...	...	...	...	...	...	...	...	...	...	5	2	...	...	...	...	...	...	...	...	...	...	...	...	5	2
	Mootoor	76		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seetabuldee ...	407	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,945	...	...	13	4	2	1	14	5	21	7	15	6	2	...	...	...	...	...	...	...	...	...	...	...	67	23
Hyderabad Subsidiary Force.	Secunderabad ...	2,145	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	12	2	2	1	...	...	...	...	15	3
	Bowenpilly ...	354	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,499	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	12	2	2	1	...	...	...	...	15	3
Ceded Districts.	Bellary	1,048	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool	492	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddapah ...	628	7	3	1	...	1	...	...	...	...	...	...	...	...	...	8	5	...	...	...	...	...	...	...	...	17	8
	Total ..	2,168	7	3	1	...	1	...	...	...	...	...	...	...	...	...	8	5	...	...	...	...	...	...	...	...	17	8
Mysore Division.	Bangalore ...	2,152	...	...	...	...	1	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Cannanore ...	1,182		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Luckady	209	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore ...	629	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hurryhur... ...	628	...	...	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3
	Mercara	471	...	...	...	...	...	...	...	...	4	3	2	2	...	...	...	...	...	...	...	...	...	...	...	...	6	5
	Calicut	83	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Troops marching	650	...	...	45	16	6	6	1	1	...	...	1	1	...	...	1	...	2	...	1	...	...	...	...	...	57	24
	Total ...	6,004	...	...	45	16	7	7	4	4	4	3	4	4	...	...	1	...	2	...	1	...	...	...	...	...	68	34
Centre Division.	Fort St. George (Madras) ...	2,083	...	...	1	1	9	3	1	...	...	...	...	...	...	...	8	4	...	...	...	...	...	...	...	...	19	8
	Saint Thomas' Mount	140	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram ...	218	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Arcot...	693	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Vellore	752	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Tripatore... ...	767	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1
	Total ...	4,653	2	1	4	4	9	3	1	...	...	...	...	...	...	...	8	4	...	...	...	...	...	...	...	...	24	12
Southern Divn...	Trichinopoly ...	1,721	8	8	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	12	9
	Quilon	642	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palamcottah ...	667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Paumben	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,052	8	8	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	12	9
Northern Divn...	Cuttack	814	...	...	6	3	...	...	48	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	54	19
	Berhampore ...	634	...	...	...	...	...	...	...	...	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	3
	Vizianagram ...	1,168	...	...	...	...	...	...	...	...	20	6	5	2	1	...	...	...	...	...	1	...	...	...	...	...	27	8
	Vizagapatam ...	801	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Masulipatam ...	684	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Dowlaishweram.	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Ellore	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	4,440	...	...	6	3	...	...	48	16	27	9	5	2	1	...	...	...	...	...	1	...	...	...	...	...	88	30
Pegu Division ...	Tonghoo	638	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyoo ...	631	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moulmein ...	635	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rangoon	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Port Blair ...	56	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,680	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Jails, 1864.

Division.	Jails.	Average Strength.	January. A.	January. D.	Feb. A.	Feb. D.	March. A.	March. D.	April. A.	April. D.	May. A.	May. D.	June. A.	June. D.	July. A.	July. D.	August. A.	August. D.	Sept. A.	Sept. D.	October. A.	October. D.	Nov. A.	Nov. D.	Dec. A.	Dec. D.	Total. A.	Total. D.
Ceded Districts.	Bellary ...	506	...	...	...	...	...	...	...	...	...	..	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Cuddapah ...	502	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	9	...	...	28	12
	Kurnool ...	244	...	...	...	...	...	...	...	...	...	...	1	...	2	1	...	...	1	1	...	...	...	...	...	...	4	2
	Total ...	1,252	7	3	...	...	...	...	...	...	...	...	2	1	2	1	...	...	1	1	...	...	21	9	...	...	33	15
Malabar and Canara.	Calicut ...	341	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore ...	107	...	...	...	...	...	Monthly returns are not available.													...	...	...	...	...	...	13	9
	Cochin ...	39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	2	...	...	...	...	...	...	7	2
	Mangalore ...	272	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	5	...	...	...	...	8	5
	Tellicherry ...	157	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	916	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	2	8	5	...	...	...	...	28	16
Northern Divn.	Masulipatam ...	108	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rajahmundry ...	134	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	322	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...	...	2	2
	Chicacole ...	228	...	...	...	...	1	1	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2
	Guntoor ...	227	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	1,019	...	...	...	...	1	1	...	...	2	1	...	...	...	...	...	...	...	...	1	1	1	1	...	...	5	4
Centre Division.	Chingleput ...	308	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chittoor ...	586	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddalore ...	365	14	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	2	...	...	...	...	...	1	...	20	...
	Guindy ...	94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Madras Penitentiary ...	419	...	...	1	...	1	...	...	...	...	...	...	...	...	...	6	4	...	...	...	...	...	...	...	...	8	4
	Her Majesty's Jail, Madras...	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nellore ...	460	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore ...	194	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,533	14	...	2	...	1	...	...	...	...	...	2	...	...	...	7	4	2	...	...	...	...	...	1	...	28	4
Southern Divn.	Coimbatore ...	387	16	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	17	10
	Madura ...	285	...	...	...	...	...	...	...	...	39	21	...	...	...	...	...	...	18	10	...	...	...	...	...	...	57	31
	Ootacamund E.	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Ootacamund N.	114	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Paumben ...	769	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Salem ...	385	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tanjore ...	122	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tranquebar ...	214	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Trichinopoly ...	378	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Tinnevelly ...	164	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,845	17	10	1	...	...	...	...	...	39	21	...	...	...	...	...	...	18	10	1	...	...	...	...	...	76	41

European Army, 1865.

Division.	Stations.	Strength.	January. T.	January. D.	February. T.	February. D.	March. T.	March. D.	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	September. T.	September. D.	October. T.	October. D.	November. T.	November. D.	December. T.	December. D.	Total. T.	Total. D.
Nagpore Force ..	Kamptee ...	1,200	1	1	...	...	9	5	...	...	4	4	...	...	...	...	1	1	...	...	...	...	...	...	...	...	15	11
	Seetabuldee ...	65	..	..	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1
	Chindwarrah ...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,326	1	1	...	..	9	5	...	...	4	4	...	..	1	1	1	1	...	...	...	...	...	...	...	...	16	12
Hyderabad Sub-sidiary Force.	Secunderabad & Trimulgherry	2,654	...	...	...	...	2	...	1	1	2	2	...	...	1	1	...	...	1	1	...	...	...	...	...	...	7	5
Ceded Districts...	Bellary... ...	1,137	...	...	...	...	..	...	7	5	12	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	9
	Ramandroog ...	63	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Total..	1,200	.	...	...	...	...	...	8	6	12	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	10
Mysore Division.	Bangalore ...	2,504	...	...	...	...	...	...	2	2	...	...	...	...	...	...	...	...	5	1	...	...	...	...	...	...	7	3
	Cannanore ...	734	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1
	Calicut	84	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Malliapoorum ...	101	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total..	3,423	...	...	...	...	...	...	2	2	...	...	...	...	...	...	...	...	6	2	...	...	..	...	...	...	8	4
Centre Divn ...	Fort St. George (Madras) ...	896	...	...	...	...	...	...	1	...	1	1	1	...	...	...	5	2	...	...	...	...	...	...	...	...	8	3
	St. Tho.s' Mount.	494	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram ...	62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Poonamallee ...	228	..	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore ...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,684	...	...	...	...	...	...	1	...	1	1	1	...	...	...	5	2	...	...	...	...	...	...	...	...	8	3
Southern Divn.	Trichinopoly ...	263	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	...	...
	Wellington ...	665	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	928	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northern Divn.	Vizagapatam ...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Masulipatam ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	11	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pegu Division...	Rangoon ...	618	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
	Thayetmyoo ...	597	...	...	...	...	..	...	...	...	2	1	...	...	2	1	...	...	..	...	1	...	..	...	3	2	8	4
	Tonghoo ...	524	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total...	1,739	...	...	...	...	...	...	...	...	2	1	...	...	2	1	...	...	...	...	1	...	...	...	3	2	8	4

Native Army, 1865.

Division.	Stations.	Strength.	January. T.	January. D.	February. T.	February. D.	March. T.	March. D.	April. T.	April. D.	May. T.	May. D.	June. T.	June. D.	July. T.	July. D.	August. T.	August. D.	September. T.	September. D.	October. T.	October. D.	November. T.	November. D.	December. T.	December. D.	Total. T.	Total. D.
			Monthly Prevalence of Cholera.																									
Nagpore Force	Kamptee ...	1,465	...	...	...	...	24	12	9	4	4	2	5	1	1	1	...	...	4	1	...	...	...	...	...	...	47	21
	Hooshungabad..	384	...	...	...	...	1	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3
	Raepore ...	749	...	...	...	...	...	...	...	...	2	1	...	...	1	1	2	1	...	...	...	...	...	...	...	...	5	3
	Mootoor ...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Seetabuldee ...	407	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,098	...	...	...	...	25	13	11	6	6	3	5	1	2	2	2	1	4	1	...	...	...	...	...	...	55	27
Hyderabad Subsidiary Force.	Secunderabad ...	2,384	..	...	21	14	11	3	...	...	...	...	2	2	4	2	2	1	...	...	...	...	...	...	...	...	40	22
	Bowenpully ...	358	...	...	...	...	..	...	4	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	5	3
	Total ...	2,742	...	...	21	14	11	3	4	2	...	...	3	3	4	2	2	1	...	...	...	...	...	...	...	...	45	25
Ceded District.	Bellary ..	1,637	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool ..	505	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddapah ...	643	...	...	...	...	...	...	...	...	8	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	5
	Total ...	2,785	...	...	...	...	...	...	...	...	8	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	5
Mysore Divn.	Bangalore ...	2,045	..	...	...	...	2	1	1	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	4	3
	Luckady ...	244	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Mysore ...	706	...	...	...	...	...	...	1	1	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	3
	Mangalore ...	736	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1
	Cannanore ...	1,386	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hurryhur ...	694	...	...	...	...	...	...	...	...	...	...	...	...	8	5	...	...	...	...	...	...	...	...	...	...	8	5
	Total ...	5,934	...	...	1	1	2	1	2	2	5	2	...	...	10	7	...	...	...	...	...	...	...	...	...	...	20	13
Centre Divn.	Fort St. George (Madras) ...	2,192	6	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	4	2	...	...	...	...	12	6
	St. Tho.s' Mount	170	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore	701	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Troops Marching	1,065	2	2	78	27	8	3	...	...	...	...	...	...	1	...	3	1	1	1	...	...	...	...	...	...	93	34
	Total ...	4,128	8	4	81	30	8	3	...	...	...	...	...	...	1	..	3	1	2	2	4	2	...	...	...	...	107	42
Southern Divn.	Trichinopoly ...	1,350	5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	6	9	7	24	14
	Quilon ...	636	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	2	1
	Palamcottah ...	644	1	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Total ...	2,630	6	2	...	...	...	...	...	...	...	...	1	1	2	1	...	...	...	...	...	...	10	6	9	7	28	17
Northern Divn.	Berhampore ...	727	...	...	...	...	...	...	1	...	1	...	3	1	3	1	...	...	...	...	...	...	...	...	...	...	8	2
	Samulcottah ...	688	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1
	Vizianagram ...	737	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	2	1
	Vizagapatam ...	746	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cuttack ...	819	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Ellore	41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	3,758	...	...	...	...	...	...	1	...	1	...	3	1	3	1	...	...	3	2	...	...	...	...	...	...	11	4
Pegue Division.	Tonghoo ...	615	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1
	Thayetmyo ...	581	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moulmein ...	631	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rangoon ...	738	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,565	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1

Jails, 1865.

Division.	Jails.	Average Strength.	Monthly Prevalence of Cholera.																									
			January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			A.	D.	A.	D	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A	D.	A.	D.	A	D.	A.	D.	A.	D
Ceded Districts.	Bellary ...	499	...	...	...	...	...	...	2	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...
	Cuddapah ...	449	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	...	2	1	...	...	...	...	4	2
	Kurnool ...	232	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	4	...
	Total ...	1,180	...	...	...	...	1	1	2	...	6	...	...	...	1	...	...	...	2	...	2	1	...	...	...	...	14	2
Malabar and Canara.	Calicut ...	463	...	...	...	...	...	...	...	...	...	...	72	38	12	11	...	...	...	...	...	...	...	...	...	...	84	49
	Cannanore ...	106	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cochin ...	574	...	...	...	...	...	...	...	...	...	...	...	...	4	1	15	13	...	...	...	...	...	...	...	...	19	14
	Mangalore ...	266	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tellicherry ...	180	...	...	...	...	1	...	...	...	...	...	27	10	3	3	1	...	...	...	...	...	...	...	...	...	32	13
	Total ...	1,589	...	...	...	...	1	...	...	...	...	...	99	48	19	15	16	13	...	...	...	...	...	...	...	...	135	76
Northern Divn.	Masulipatam ...	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Vizagapatam ...	352	...	...	...	...	...	...	...	...	4	2	7	4	30	16	2	1	...	...	...	...	...	...	4	3	47	26
	Rajahmundry ...	121	...	...	...	...	...	...	...	...	7	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	1
	Berhampore ...	268	...	...	...	...	...	...	...	...	...	...	17	3	2	...	...	...	...	...	...	...	...	...	...	...	19	3
	Total ...	851	...	...	...	...	...	...	...	...	11	3	24	7	32	16	2	1	...	...	...	...	...	...	4	3	73	30
Centre Division.	Chingleput ...	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chittoor ...	693	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Cuddalore ...	361	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...
	Guindy ...	90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Madras Penitentiary.	379	...	...	...	...	...	...	...	...	...	...	...	...	1	1	8	6	1	...	...	...	...	...	...	...	10	7
	Her Majesty's Jail, Madras.	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Guntoor ...	286	...	...	...	...	5	4	11	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16	8
	Vellore ...	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,272	...	...	1	1	5	4	12	4	...	...	...	...	1	1	8	6	1	...	...	...	...	...	1	...	29	16
Southern Divn.	Coimbatore ...	379	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	1	3	1
	Madura ...	244	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	3	2	...	...	7	3	3	2	15	9
	Ootacamund ...	15	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
	Paumben ...	175	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Salem ...	538	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tanjore ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tranquebar ...	249	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Trichinopoly ...	325	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Combaconum ...	289	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tinnevelly ...	146	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	2,483	...	...	2	2	...	...	1	...	...	...	...	...	...	...	2	2	4	2	...	...	7	3	4	3	20	12

APPEN

Statement showing the Monthly Prevalence of Cholera

of Registration Circles, Talooks, ns, Jails, Cantonments, &c.	Geographical position of Registration Circles, (Talooks) Towns, &c., (Talooks relative to Districts and Towns relative to Talooks.)	Population according to last census.	January. No. of Cases of Cholera reported.	January. No. of Deaths of Cholera reported.	February. No. of Cases of Cholera reported.	February. No. of Deaths of Cholera reported.	March. No. of Cases of Cholera reported.	March. No. of Deaths of Cholera reported.	April. No. of Cases of Cholera reported.	April. No. of Deaths of Cholera reported.	May. No. of Cases of Cholera reparted.	May. No. of Deaths of Cholera reported.	June. No. of Cases of Cholera reported.	June. No. of Deaths of Cholera reported.
oor R. C. (Talook)	N. of District ...	134,832	...	3	...	...	...	3	...	5	...	3	...	5
npore, R. C. (Talook)... ...	N. E. of do ...	214,649	...	4	...	...	...	2	...	1	...	2	...	2
njam, C. Sn.	......	7,036	...	...	...	...	...	...	...	...	...	...	...	...
hapore, T.	......	5,587	...	...	...	...	...	...	...	...	...	...	...	...
rhampore, M. T.	N. W. of Talook ...	20,570	...	1	...	...	...	1	...	...	...	...	...	2
rhampore, J.	do ...	180	...	...	...	...	...	...	...	...	...	...	...	...
rhampore, Ct....	do ...	...	...	1	...	...	...	...	...	...	...	...	...	...
rhampore, Troops, Native ...	do ...	364	...	...	...	...	...	...	...	...	...	...	...	...
ole, R. C. (Talook)	S. of District ...	154,593	...	...	...	...	...	1	...	1	...	1	...	1
icacole M. T.	S. of Talook ...	14,686	...	...	...	...	...	...	...	...	...	...	...	...
daries	......	731,716	...	...	...	3	...	2	...	5	...	8	...	1
rwah, T.	S. E. of Talook ...	6,927	...	...	...	...	...	...	...	...	...	...	...	...
medy, T.	S. W. of do ...	10,356	...	...	...	...	...	...	...	...	...	...	...	...
goonathapooram, T.	S. of do ...	5,182	...	...	...	...	...	...	...	...	...	...	...	...
ommah Fort	......	7,615	...	...	...	...	...	...	...	...	...	...	...	...
Total District...	......	1,237,209	...	7	...	3	...	8	...	12	...	14	...	9
dah, R. C. (Talook)	N. of District ...	138,579	...	...	...	2	...	...	...	...	...	...	...	...
lcondah, M. T.	N. E. of Talook ...	8,410	...	...	...	...	...	...	...	...	...	...	...	...
ipore, R. C. (Talook)	N. of District ...	118,900	...	...	...	...	...	...	...	4	...	...	...	...
rvatipore, T.	N. of Talook ...	6,259	...	...	...	...	...	...	...	...	...	...	...	...
i, R. C. (Talook)	N. of District ...	112,367	...	...	...	...	...	...	...	...	...	...	...	...
bbili, T.	N. of Talook ...	19,484	...	...	...	...	...	...	...	...	...	...	...	...
R. C. (Talook)	N. of District ...	61,179	...	...	...	...	...	...	...	...	...	...	...	...
lur, T.	N. of Talook ...	9,278	...	...	...	...	...	...	...	...	...	...	...	...
agram, R. C. (Talook) ...	S. E. of District ...	107,180	...	...	...	2	...	...	...	1	...	...	...	...
zianagram M. T.	S. E. of Talook ...	14,046	...	...	...	...	...	...	...	...	...	...	...	...
zianagram, Troops, Native ...	......	652	...	...	...	...	...	...	...	...	...	...	...	...
atam, R. C. (Talook) ...	S. E. of District ...	85,866	...	...	...	1	...	2	...	2	...	...	...	...
mlipatam M. T.	S. E. of Talook ...	5,192	...	...	...	...	...	...	...	...	...	...	...	...
patam R. C. (Talook) ...	S. E. of District ...	64,933	...	...	...	1	...	...	...	2	...	...	...	...
zagapatam, M. T. & C. Sn. ...	S. E. of Talook ...	16,867	...	...	...	...	...	...	...	...	...	...	...	...
zagapatam, J.	......	265	...	...	...	...	...	...	...	...	...	...	...	...
zagapatam, L. A.	......	...	...	...	...	...	...	...	...	...	...	...	...	...
zagapatam, Troops {E. ...	......	73	...	...	...	...	...	...	...	...	...	...	...	...
{N. ...	......	784	...	...	...	...	...	...	...	...	...	...	...	...
ally, R. C. (Talook)	S. E. of District ...	150,521	...	...	...	...	...	...	...	...	...	...	...	7
kapally, T.	S. E. of Talook ...	13,333	...	...	...	...	...	...	...	...	...	...	...	...
daries	......	665,520	...	...	...	3	...	3	...	2	...	...	...	3
wrungapoor, T.	N. W. of District ...	5,096	...	...	...	...	...	...	...	...	...	...	...	...
nnapoor, T.	do ...	5,245	...	...	...	...	...	...	...	...	...	...	...	...
ypore, T.	do ...	12,311	...	...	...	...	...	...	...	...	...	...	...	...
dgoli, T.	S. W. do ...	6,623	...	...	...	...	...	...	...	...	...	...	...	...
simcottah, T.	S. E. do ...	6,220	...	...	...	...	...	...	...	...	...	...	...	...
Total District...	......	1,505,045	...	...	...	9	...	5	...	11	...	...	...	10
mundry, R. C. (Talook) ...	N. of District ...	100,924	...	...	...	...	...	...	...	...	...	48	...	175
wlaishweram, T.	N. W. of Talook ...	5,890	...	...	...	...	...	...	...	...	...	...	...	...
mulcottah, T.	E. of do ...	7,810	...	...	...	...	...	...	...	...	...	...	...	...
conada, M. T. and C. Sn. ...	do	16,167	...	...	...	...	...	...	...	...	...	...	...	2
ganaikpatam, T	do	5,690	...	...	...	...	...	...	...	...	...	...	...	...
jahmundry, M. T.	S. of Talook ...	17,498	...	...	...	...	...	...	...	...	...	46	...	59
jahmundry, J....	......	934	...	...	...	...	...	...	...	...	16	4	...	...

DIX IV.

in the Madras Presidency during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera Reported.	No. of Cases of Cholera Reported.	No. of Deaths of Cholera Reported.	No. of Cases of Cholera Reported.	No. of Deaths of Cholera Reported.	No. of Cases of Cholera Reported.	No. of Deaths of Cholera Reported.	No. of Cases of Cholera Reported.	No. of Deathsof Cholera Reported.	No. of Cases of Cholera Reported.	No. of Deaths of Cholera Reported.	No. of Cases of Cholera Reported.	No. of Deaths of Cholera Reported	Dato of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
...	8	...	6	...	...	...	...	...	...	...	2	...	35	10	24	...	...	20	23	10	25	1	28	1	28	5	30	12	23	...	...	...	...	...	...
...	2	...	19	...	17	...	...	...	1	...	7	...	57	1	30	...	...	15	20	29	29	10	20	18	21	10	19	8	31	3	26	...	...	5	[illegible]
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	10	...	6	...	...	...	...	...	...	...	20	30	30	...	...	15	15	...	...	...	...	18	21	...	...	25	31	3	20	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	9	...	1	...	...	...	...	...	...	...	11	30	30	...	...	...	...	...	...	...	...	...	...	...	...	25	31	14	14	...	.	...	.
...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	18	...	...	...	...	...	...
...	3	...	7	...	3	...	1	...	1	...	1	...	20	...	...	...	.	15	15	3	3	2	2	15	15	2	28	6	28	6	30	10	10	25	25
...	...	...	1	...	2	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	28	28	15	30	...	...	...	...
...	33	...	166	...	46	...	1	...	...	...	5	...	270	...	...	1	15	15	28	1	25	5	22	1	1	8	31	1	31	1	27	7	7	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	18	...	60	...	...	...	...	...	...	...	...	...	78	...	...	...	...	...	...	...	...	...	...	...	...	28	31	1	23	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	46	...	198	...	66	...	2	...	2	...	15	...	382	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	10	..	8	...	...	...	2	...	...	...	22		...	7	16	...	...	...	...	...	...	...	...	...	...	2	21	2	23	...	...	6	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	...	2	...	...	...	...	...	...	...	...	...	7	...	...		...	...	...	3	18	..	...	...	...	15	15	8	16	...	...	...	...	...	...
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...	1	...	1	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	12	12	14	14	...	...	...	...	...	...
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...	...	...	3	...	1	...	...	...	...	...	...	...	4	...	...	...	...	.	...	...	...	...	...	...	...	...	...	5	18	15	15	...	...	...	...
...	...	...	3	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	18	...	...	...	...	...	...
...	23	...	28	...	3	...	...	...	2	...	...	...	59	...	...	12	21	...	...	11	11	...	...	...	...	4	31	3	28	8	15	...	...	2	15
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	34	...	1	...	5	...	...	...	3	...	..	...	48	...	...	6	6	8	15	4	14	...	...	...	..	8	31	8	8	6	24	...	...	5	19
...	...	...	...	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	11	...	...	...	...
...	2	...	2	...	5	...	...	...	6	...	...	...	18	...	...	10	10	...	...	5	21	...	...	...	...	12	15	6	13	3	24	...	...	5	22
...	...	...	...	...	3	...	...	...	4	...	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	13	...	...	5	18
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	4	...	...	...	2	...	...	...	5	...	...	...	18	...	...	...	...	...	...	...	...	...	...	4	23	2	25	...	...	10	17	...	...	7	25
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	7	...	31	...	27	...	...	...	5	...	2	...	81	...	...	9	15	11	20	15	20	...	...	3	9	2	25	2	26	3	28	...	..	12	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	2	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	3	7	...	...	...	...	...	...	.	...
...	72	...	78	...	51	..	...	...	21	...	2	...	259	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
...	226	...	275	...	83	...	43	...	10	...	...	...	867	...	...	...	...	...	...	...	...	7	30	1	30	1	31	1	31	1	29	1	30	2	22
...	48	...	2	...	2	...	30	...	...	...	...	...	82	...	...	...	...	...	...	...	...	...	...	...	...	1	16	8	14	20	26	6	31	...	..
...	...	...	5	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	31	...	...	...	...	...	...
...	12	...	33	...	18	...	3	...	22	...	7	...	95	...	...	...	...	...	...	...	...	...	...	6	21	14	30	1	30	7	28	10	12	1	30
...	2	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	18	21	...	...	...	...	...	...	...	...
...	18	...	4	...	12	...	4	...	4	...	...	...	147	..	...	...	...	...	...	...	...	7	30	1	30	1	27	17	18	10	27	19	25	1	11
...	...	...	...	...	...	...	..	...	...	...	...	16	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Statement showing the monthly prevalence of Cholera in the

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments &c.	Geographical position of Registration Circles, (Talooks) Towns &c., (Talooks relative to Districts and Towns relative to Talooks.)	Population according to last census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholara reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
Godavery.—*Continued.*	Peddapore, R. C. (Talook)	N. of District ..	101,539	..	..	..	..	..	..	..	1	..	..	..	298
	Tuni, T.	N. E. of Talook ..	5,190	..	..	..	..	..	..	..	..	..	..	..	..
	Pettapooram, T.	S. E. of do. ..	8,006	..	..	..	..	..	..	..	..	..	..	..	..
	Peddapore, T.	S. do. ..	8,938	..	..	..	..	..	..	..	..	..	..	..	1
	Ramachendrapore, R. C. (Talook) ...	E. of District ..	184,110	..	..	..	..	..	..	..	..	..	4	..	183
	Coringa, T...	E. of Talook ..	6,833	..	..	..	..	..	..	..	..	..	..	..	..
	Polikur, T...	do. ..	6,455	..	..	..	..	..	..	..	..	..	..	..	..
	Mundapett, T.	W. of Talook ..	5,518	..	..	..	..	..	..	..	..	..	..	..	..
	Amalapore, R. C. (Talook)	S. E. of District ..	189,233	..	..	..	..	..	..	..	..	..	7	..	413
	Pellivella, T.	N. of Talook ..	5,228	..	..	..	..	..	..	..	..	..	..	..	3
	Amalapore, T.	Centre of Talook ..	6,029	..	..	..	..	..	..	..	..	..	..	..	86
	Narasapore, R. C. (Talook)	S. of District ..	161,537	..	..	..	..	..	..	..	3	..	76	..	214
	Achenta, T.	N. of Talook ..	5,433	..	..	..	..	..	..	..	..	..	..	..	5
	Narasapore, T.	do. ..	5,898	..	..	..	..	..	..	..	..	..	..	..	2
	Ellore, R. C. (Talook)	S. W. of District ..	118,735	..	..	..	..	..	..	..	4	..	98	..	159
	Ellore, M. T.	S. of Talook ..	19,940	..	..	..	..	..	..	..	1	..	65	..	30
	Undi, R. C. (Talook)	S. W. of District ..	83,826	..	..	..	..	..	..	..	..	..	11	..	159
	Tanaku, R. C. (Talook)	S. of do. ..	152,052	..	..	..	..	..	..	..	12	..	85	..	1011
	Yernagudiem, R. C. (Talook) ...	W. of do. ..	130,383	..	..	..	..	..	..	..	52	..	33	..	280
	Zemindaries, R. C. ...	....	205,133	..	..	..	..	..	..	..	..	..	3	..	119
	Total District...	......	1,427,472	..	..	..	..	..	..	..	72	..	365	..	3011
Kistna.	Nundigama, R. C. (Talook)	N. of District ..	98,637	..	..	..	..	..	..	..	..	..	..	..	..
	Juggiapettah, T.	W. of Talook ..	8,328	..	..	..	..	..	..	..	..	..	..	..	..
	Bezwada, R. C. (Talook)	N. of District ..	73,373	..	..	..	..	..	..	..	..	..	..	..	4
	Nazid, T	N. of Talook ..	5,561	..	..	..	..	..	..	..	..	..	..	..	..
	Bezwada, T.	S. of do. ..	5,154	..	..	..	..	..	..	..	..	..	..	..	1
	Gudiwada, R. C. (Talook)	N. E. of District ..	80,171	..	..	..	..	..	..	..	..	..	..	..	38
	Masulipatam, R. C. (Talook)	E. of do. ..	146,522	..	..	..	..	..	..	..	..	..	..	..	4
	Masulipatam, M. T, and C Sn, ...	N. E. of Talook ..	27,902	..	..	..	..	..	..	..	..	..	..	..	4
	Masulipatam, J.	......	96	..	..	..	..	..	..	..	..	..	..	..	..
	Rapalli R. C, (Talook)	S. of District ..	155,092	..	..	..	..	..	..	..	..	..	..	..	..
	Bapetla, R. C. (Talook)	do. ..	129,528	..	..	..	..	..	..	..	..	..	..	..	..
	Cheralah, T.	N. of Talook ..	7,956	..	..	..	..	..	..	..	..	..	..	..	..
	Bapetla, T.	E. of do. ..	9,942	..	..	..	..	..	..	..	..	..	..	..	..
	Rajahpet, R. C. (Talook)	S. of District ..	102,136	..	..	..	..	..	..	..	..	..	..	..	..
	Vennakonda, R. C. (Talook) ...	S. W. of do.	52,574	..	..	..	..	..	..	..	..	..	..	..	..
	Palnaud, R, C. (Talook)	do. ..	106,395	..	..	..	..	..	12	..	6	..	..	..	..
	Crosur, R. C. (Talook)	N. W. of District ..	84,000	..	..	..	..	..	..	..	..	..	..	..	..
	Guntoor, R. C. (Talook)	Centre of do. ..	113 963	..	..	..	..	..	..	..	..	..	..	..	..
	Guntoor, M. T.	Centre of Talook ..	15,184	..	..	..	..	..	..	..	..	..	..	..	..
	Guntoor, J.	......	99	..	..	..	..	..	..	..	..	..	..	..	..
	Prathepad T.	S. of Talook ..	6,707	..	..	..	..	..	..	..	..	..	..	..	..
	Zemindaries	......	154,261	..	..	..	..	..	..	..	..	..	..	..	24
	Total District...	......	1,296,652	..	..	..	..	..	12	..	6	..	..	..	70

Madras Presidency during the year 1870.—(Continued.)

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera Reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
..	338	..	342	..	84	..	1	..	7	..	..	..	1,071	..	..	..	..	..	..	9	9	..	..	5	30	1	31	1	29	1	28	18	18	1	10	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	18	..	..
..	..	..	1	..	1	..	..	..	1	..	..	..	4	..	..	..	..	..	..	..	..	..	..	15	15	..	..	6	6	15	15	..	..	10	10	..	..
..	968	..	808	..	165	..	52	..	49	..	9	..	2,238	..	..	..	..	..	..	..	..	28	31	1	30	1	31	1	31	1	30	1	31	1	30	1	12
..	..	...	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	29	29	..	..	..	..	..	..	..	..
..	..	..	6	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	25	..	..	..	..	..	..	..	..
..	..	...	25	..	16	..	9	..	2	..	..	..	52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	30	1	18	2	26	1	18	..	..
..	813	..	222	..	102	..	87	..	69	..	10	..	1,724	..	..	..	..	..	..	..	..	10	29	1	30	1	31	1	31	1	30	1	31	1	29	2	17
..	..	..	6	..	9	..	..	..	..	..	..	..	18	..	..	..	..	..	..	..	..	..	..	20	30	..	..	1	15	13	25	..	..	..	..	..	..
..	50	..	2	..	..	..	4	..	1	..	..	..	143	..	..	..	..	..	..	..	..	..	..	1	28	1	20	9	10	..	..	4	10	1	1	..	..
..	823	..	280	..	48	..	12	..	..	..	..	..	1,456	..	..	..	..	..	..	20	25	1	31	1	30	1	31	1	29	1	30	4	20	..	..	..	..
..	49	..	4	..	..	..	..	..	..	..	..	..	58	..	..	..	..	..	..	..	..	..	..	10	28	10	31	7	20	..	..	..	..	..	..	..	..
..	10	..	6	..	5	..	..	..	..	..	..	..	23	..	..	..	..	..	..	..	..	..	..	10	12	11	30	9	18	30	30	..	..	..	...	..	..
..	148	..	210	..	21	..	8	..	9	..	...	..	664	..	..	..	..	..	..	26	30	1	31	1	30	1	31	1	31	1	29	1	11	10	27	..	..
..	45	..	46	..	2	..	4	..	..	..	..	..	193	..	..	..	..	..	..	29	29	8	31	1	30	4	30	1	30	4	7	1	10	..	..	..	..
..	458	..	233	..	37	..	1	..	..	..	..	..	899	..	..	..	..	..	..	..	..	15	31	3	30	1	31	1	31	1	21	18	18	..	..	..	..
..	1017	..	356	..	16	..	8	..	17	..	7	..	2,522	..	..	..	..	..	..	15	30	2	31	1	30	1	31	1	31	2	30	4	18	6	30	3	20
..	149	..	122	..	14	..	10	..	..	..	..	..	660	..	..	..	..	..	..	12	29	4	31	1	30	1	31	1	31	3	29	4	26	..	..	..	..
..	291	..	656	..	98	..	13	..	25	..	..	..	1,205	..	..	..	..	..	..	..	..	13	31	1	30	1	31	1	31	1	30	2	20	1	30	..	..
..	5231	..	3504	..	668	..	235	..	186	..	33	..	13,305	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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..	142	..	215	..	31	..	2	..	2	..	..	..	396	..	..	..	..	..	..	..	..	..	..	10	23	1	31	1	31	1	13	12	19	19	20	..	...
..	..	..	11	..	..	..	..	..	..	..	..	..	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	30	..	..	..	..	..	..	..	...
..	..	..	5	..	2	..	..	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	10	10	..	..	3	22	2	13	..	..	..	..	..	..
..	91	..	203	..	57	..	13	..	..	..	..	..	402	..	..	..	..	..	..	..	..	..	..	7	29	1	31	1	31	1	30	1	31	..	..	..	...
..	46	..	214	..	63	..	17	..	2	..	..	..	346	..	..	..	..	..	..	..	..	..	..	14	25	2	31	2	31	1	29	3	22	3	28	..	...
..	17	..	21	..	18	..	4	..	..	..	..	..	64	..	..	..	..	..	..	..	..	..	..	14	25	2	31	2	28	7	18	8	22	..	..	..	...
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	...
..	15	..	35	..	3	..	6	..	..	..	..	..	59	..	..	..	..	..	..	..	..	..	..	..	..	4	31	3	31	14	28	1	31	..	..	..	...
..	..	..	..	..	..	..	6	..	4	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	22	2	21	..	..
..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	...	..	..	..	..	..	..	..	..	..	..	8	8	..	..	..	...
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..	..	..	..	..	6	..	14	..	..	..	..	..	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	25	1	31	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	18	..	..	..	..	20	30	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	42	..	2	..	..	..	..	..	..	..	44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	31	14	20	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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..	268	..	398	..	31	..	4	..	..	..	..	..	725	..	..	..	..	..	..	..	..	..	..	4	30	1	31	1	31	..	..	2	5	..	..	..	..
..	566	..	1129	..	201	..	62	..	8	..	..	..	2,054	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles (Talooks) Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles, Talooks, Towns, &c., (Talooks relative to Districts and Towns relative to Talooks.)	Population according to last Census.	January. No. of Cases of Cholera reported.	January. No. of Deaths of Cholera reported.	February. No. of Cases of Cholera reported.	February. No. of Deaths of Cholera reported.	March. No. of Cases of Cholera reported.	March. No. of Deaths of Cholera reported.	April. No. of Cases of Cholera reported.	April. No. of Deaths of Cholera reported.	May. No. of Cases of Cholera reported.	May. No. of Deaths of Cholera reported.	June. No. of Cases of Cholera reported.	June. No. of Deaths of Cholera reported.
Nellore.	Ongole, R. C. (Talook)	N. of District ...	133,333	...	...	...	...	...	3	...	1	...	...	...	...
	Addenky, T.	N. of Talook ...	5,068	...	...	...	...	...	3	..	...	...	...	...	...
	Ongole, T.	Centre of do. ...	5,832	...	...	...	...	...	...	...	...	...	...	...	...
	Allurand Kottapattanam, T. ...	S. E. of do. ...	6,512	...	...	...	...	...	...	...	...	...	...	...	...
	Tungathoor, T.	Do. ...	5,364	...	...	...	...	...	...	...	...	...	...	...	...
	Kundukur, R. C. (Talook)	N. of District ...	93,753	...	...	...	...	...	...	...	...	...	...	...	...
	Kundukur, T.	Centre of Talook ...	6,324	...	...	...	...	...	...	...	...	...	...	...	...
	Kavalli, R. C. (Talook)	Centre of District ...	52,245	...	1	...	21	...	2	...	...	...	...	...	...
	Nellore, R. C. (Talook)	E. of do. ...	142,606	...	4	...	70	...	44	...	1	...	...	...	...
	Nellore, M. T. and C. Sn. ...	Centre of Talook ...	22,851	...	1	...	57	...	6	...	...	...	...	...	...
	Nellore, J.	......	182	...	...	8	6	...	1	...	...	...	...	...	...
	Gudur, R. C. (Talook)	S. of District ...	94,784	...	60	...	46	...	19	...	...	...	...	...	7
	Gudur, T.	S. W. of Talook ...	5,123	...	1	...	...	...	2	...	...	...	...	...	1
	Kotay, T.	......	5,265	...	20	..	36	...	3	...	...	...	...	...	...
	Raipur, R. C. (Talook)	S. W. of District ...	52,268	...	...	...	...	...	5	...	1	...	...	...	...
	Atmakur, R. C. (Talook)	Centre of do. ...	86,844	...	43	...	23	...	31	...	2	...	...	...	...
	Udayagiri, R. C. (Talook)	Do. ...	48,694	...	7	...	...	...	...	...	...	..	...	...	...
	Kanigiri, R. C. (Talook)	Do. ...	50,778	...	...	...	.	...	5	...	...	...	...	...	...
	Zemindaries.	......	413,359	...	26	...	20	...	3	...	4	...	...	...	3
	Venkatagherri, T.	......	6,989	...	1	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,168,664	...	141	...	180	...	112	...	9	...	...	...	10
Madras.	Madras, R. C. (Town)	......	450,000	...	37	...	15	...	9	...	48	...	79	...	391
	Madras, J.	......	510	...	...	...	...	...	...	...	...	...	...	1	...
	Madras, L. A.	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Madras Troops {E.	......	767	...	...	1	1	11	5	...	...	...	...	...	...
	Madras Troops {N.	......	2,164	...	...	...	...	...	...	...	...	...	...	7	4
Chingleput.	Ponnari, R. C. (Talook)	N. of District ...	93,551	...	8	...	1	...	2	..	1	...	2	...	13
	Trivellore, R. C. (Talook)	N. W. of do. ...	133,165	...	8	...	7	...	...	...	8	...	24	...	47
	Sydapett, R. C. (Talook)	E. of do. ...	157,916	...	5	...	...	...	6	...	5	...	19	...	15
	Sydapett, T. and C. Sn.... ...	E. of Talook ...	7,544	...	...	...	...	...	...	...	...	...	...	...	...
	Sydapett Guindy, J.	......	74	...	...	...	...	...	...	...	...	...	...	...	...
	St. Thomas' Mount, Ct.	......	12,562	...	...	...	...	...	...	...	...	...	...	...	...
	St. Thomas' Mount troops {E...	......	463	...	...	...	...	...	...	...	...	...	...	...	...
	St. Thomas' Mount troops {N...	......	183	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram, Ct.	E. of Talook ...	3,233	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram troops {E.	......	281	...	...	...	...	...	...	...	...	...	...	...	...
	Palaveram troops {N.	......	131	...	...	...	...	...	...	...	...	...	...	...	...
	Poonamallee, T.	N. W. of Talook ...	5,462	...	...	...	...	...	...	...	2	...	...	...	...
	Poonamallee, Ct.	......	3,792	...	...	...	...	...	...	...	...	...	3	...	...
	Poonamallee, Depôt E.	......	158	...	...	...	...	...	...	...	...	...	...	...	...
	Chingleput, R. C. (Talook)... ...	S. E. of District ...	102,076	...	1	...	...	...	...	...	1	...	12	...	93
	Chingleput, T.	N. W. of Talook ...	5,618	...	...	...	...	...	...	...	...	...	...	...	...
	Chingleput, J.	......	209	...	...	...	...	...	...	...	...	...	...	...	...
	Madarantakum, R. C. (Talook) ...	S. of District ...	163,508	...	37	...	30	...	...	...	1	...	61	...	141
	Ootramalur, T.	E. of Talook ...	6,196	...	...	...	...	...	...	...	..	...	...	...	...
	Conjeveeram, R. C. (Talook) ...	W. of District ...	154,067	...	58	...	16	...	...	...	...	...	169	...	242
	Conjeveeram, T....	W. of Talook ...	31,939	...	23	...	7	...	...	...	...	...	53	...	36
	Total District ...	......	804,283	...	117	...	54	...	8	...	16	...	287	...	551

in the Madras Presidency, during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
...	...	...	10	...	53	...	1	...	...	...	...	...	68	...	...	...	...	22	31	5	5	...	...	...	...	...	...	19	25	1	31	4	4	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	22	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	1	...	1	...	3	...	3	...	2	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	2	2	26	26	9	20	9	22	10	15	...	...
...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22	22	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	24	25	25	1	28	11	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	...	...	...	1	...	...	...	2	...	...	...	123	11	30	1	28	1	29	3	3	...	...	...	...	2	2	...	...	10	10	...	...	2	10	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	64	30	30	1	28	3	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	8	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	4	...	...	...	...	...	...	...	3	...	2	...	141	3	31	1	28	2	20	...	...	...	...	1	7	11	20	...	...	...	...	...	...	4	27	3	6
...	...	...	...	...	...	...	...	...	...	...	...	...	4	14	14	...	...	9	9	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	59	4	27	1	26	8	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	2	...	...	...	...	...	...	...	8	...	...	...	...	4	17	10	10	...	...	...	...	...	...	...	...	19	23	...	...	...	...	...	...
...	1	...	2	...	...	...	...	...	4	...	1	...	107	1	29	2	27	1	23	5	7	...	...	...	...	23	23	14	20	...	...	...	...	15	25	2	2
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...	20	...	7	...	15	...	16	...	3	...	...	...	117	10	26	1	27	1	16	2	3	...	...	4	20	1	25	15	30	3	27	1	30	1	11	...	...
...	1	...	...	...	...	...	...	...	...	...	...	...	2	24	24	...	...	...	...	...	...	...	...	...	...	24	24	...	...	...	...	...	...	...	...	...	...
...	27	...	20	...	76	...	20	...	14	...	4	...	613	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	113	...	121	...	20	...	22	...	3	...	3	...	861	3	30	2	22	1	29	6	30	2	31	1	30	1	31	1	31	1	29	3	29	8	17	12	19
1	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	10	...	...	...	5	...	...	...	...	...	...	...	42	3	21	22	22	14	19	20	20	3	31	2	26	3	18	...	...	1	6	...	...	...	...	...	...
...	3	...	2	...	29	...	4	...	1	...	7	...	140	4	25	12	19	...	...	14	25	2	30	1	26	12	17	1	19	3	28	2	8	14	14	2	19
...	25	...	3	...	10	...	12	...	6	...	2	...	108	5	29	...	...	10	17	6	26	10	31	2	28	1	30	10	19	2	21	6	28	8	28	4	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	38	...	10	...	1	...	...	...	1	...	4	...	161	28	28	...	...	...	...	13	13	10	31	1	30	1	30	6	25	9	9	...	...	8	8	2	26
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	45	...	23	...	6	...	17	...	1	...	2	...	364	6	30	1	30	...	...	12	12	5	31	1	29	1	31	1	30	24	27	1	20	17	17	13	16
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	31	...	34	...	12	...	2	...	10	...	5	...	579	1	30	1	26	...	...	...	...	6	31	1	30	1	30	1	28	1	26	15	31	1	21	1	27
...	3	...	...	...	3	...	...	...	...	...	...	...	125	9	29	1	24	...	...	...	...	3	31	1	22	10	24	...	...	1	5	...	...	...	...	...	...
...	152	...	72	...	63	...	35	...	19	...	20	...	1,394	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles (Talooks) Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks) Towns, &c., (Talooks relative to Districts and Towns relative to Talooks.)	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
South Arcot.	Tindevanam, R. C. (Talook) ...	N. of District ...	163,752	...	49	...	12	...	...	...	...	...	92	...	83
	Trinomalay, R. C. (Talook) ...	N. W. of do. ...	101,473	...	1	...	1	...	...	...	...	...	84	...	20
	Trinomalay, T.	E. of Talook ...	6,073	...	1	...	...	...	...	...	...	...	...	...	...
	Villapooram, R. C. (Talook) ...	N. E. of District ...	200,404	...	72	...	29	...	11	...	2	...	42	...	45
	Villapooram, T.	S. of Talook... ...	5,212	...	...	...	...	...	...	...	...	...	1	...	...
	Villavanoor, T.	do. ...	8,438	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddalore, R. C. (Talook)	E. of District ...	201,989	...	153	...	30	...	18	...	5	...	5	...	66
	Cuddalore, M. T. and C. Sn. ...	do. ...	28,421	...	4	...	7	...	...	...	...	...	1	...	4
	Cuddalore, J.	do. ...	301	...	...	...	...	...	...	...	...	...	...	...	...
	Punrooty, T.	N. of Talook ...	5,464	...	...	...	...	...	2	...	...	...	...	...	...
	Chillambaram, R. C. (Talook) ...	S. E. of District ...	184,014	...	176	...	71	...	25	...	23	...	4	...	25
	Porto Novo, T.	N. E. of Talook ...	6,380	...	2	...	19	...	4	...	...	...	...	...	...
	Chillambaram, T...	E. of do. ...	14,354	...	27	...	...	...	1	...	...	...	...	...	...
	Bavangiri, T.	S. of do. ...	7,236	...	...	..	...	...	...	...	...	..	...	...	...
	Poothooroyenpettah, T.	....	6,010	...	...	...	...	...	...	...	...	...	...	...	...
	Virdachellum, R. C. (Talook) ...	S. E. of District ...	154,718	...	78	...	32	...	17	...	42	...	5	...	7
	Kullacoorchi, R. C. (Talook) ...	S. W. of District ...	121,857	...	79	...	38	...	53	...	12	...	...	...	...
	Chinna Salem, T.	S. W. of Talook ...	5,061	...	2	...	2	...	...	...	..	...	...	...	...
	Yellavannasoor, R. C. (Talook) ...	Centre of District ...	133,609	...	9	...	33	...	26	...	34	...	6	...	54
	Zemindaries, ...	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total Districts ...	......	1,261,846	...	617	...	246	...	150	...	118	...	238	...	300
Trichinopoly.	Wodiarpolliem, R. C. (Talook) ...	N. E. of District ...	190,204	...	100	...	11	...	2	...	21	...	...	...	11
	Arealore, T.	S. W. of Talook ...	5,156	...	...	...	...	...	1	...	...	...	...	...	...
	Woodiarpolliem, T.	....	5,218	...	1	...	...	...	...	...	...	...	...	...	...
	Trichinopoly, R. C. (Talook) ...	S. of District ...	255,397	...	654	...	192	...	49	...	21	...	5	...	1
	Trichiuopoly, M. T. and C. Sn...	....	55,730	...	219	...	62	...	5	...	...	...	...	...	...
	Trichiuopoly, J.	....	901	...	...	...	...	...	...	...	...	...	...	...	...
	Trichinopoly, L. A.	....	...	...	...	...	...	...	...	...	...	...	...	...	...
	Trichinopoly, Ct	....	9,465	...	68	...	9	...	1	...	...	...	...	...	...
	Trichinopoly, Troops E. ...	....	333	...	...	...	...	...	...	...	...	...	...	...	...
	Trichinopoly, Troops N. ...	....	1,363	7	4	2	...	...	...	...	...	...	...	...	...
	Sreerungum, T.	N. W. of (Talook) ...	8,910	...	7	...	20	...	2	...	...	...	...	...	...
	Veerupathipooram, T.	W. of do. ...	7,450	...	...	...	...	...	...	...	...	...	...	...	...
	Kullitalli, R. C. (Talook)	S. W. of do. ...	190,880	...	50	...	28	...	81	...	58	...	1	...	1
	Mooseri, R. C. (Talook)	N. W. of do. ...	226,273	...	98	...	40	...	33	...	5	...	1	...	...
	Torriore, T.	Centre of Talook ...	6,186	...	1	...	...	...	...	...	...	...	...	...	...
	Perambalore, R. C. (Talook) ...	N. of District ...	144,072	...	58	...	73	...	27	...	17	...	...	...	1
	Zomindaries	....	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total Districts ...	......	1,006,826	...	960	...	344	...	192	...	122	...	7	...	14
Tanjore.	Sheally, R. C. (Talook)	N. of District ...	97,045	...	45	...	18	...	13	...	1	...	5	...	82
	Sheally, T.	Centre of Talook ...	5,700	...	...	...	...	...	...	...	...	...	...	...	...
	Mayaveram, R. C. (Talook)... ...	N. of District ...	193,852	...	231	...	31	...	7	...	5	...	10	...	24
	Mayaveram, M. T.	N. of Talook ...	17,025	...	47	...	7	...	1	...	1	...	1	...	4
	Tranquebar, T.	......	17,972	...	...	...	...	...	...	...	...	...	...	...	...
	Tranquebar, J.	....	1,391	...	...	...	...	...	...	...	...	...	...	...	...
	Porayar, T.	......	5,196	...	...	...	...	...	...	...	...	...	...	...	...

in the Madras Presidency, during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported,	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
...	12	...	23	...	10	...	...	...	...	...	...	...	281	1	29	1	17	...	...	...	...	1	31	1	30	3	19	1	31	1	26	...	...	...	...	...	...
...	5	...	18	...	...	...	...	...	1	...	...	...	130	18	18	27	27	...	...	...	...	1	30	4	23	10	27	1	25	...	...	...	...	11	11	...	...
...	1	...	..	...	...	...	...	...	...	...	...	...	2	18	18	...	...	...	...	...	...	...	...	...	...	13	13	...	...	...	...	...	...	...	...	...	...
...	80	...	21	...	17	...	2	...	7	...	...	...	328	2	30	2	25	2	22	14	29	1	31	1	28	1	28	2	29	2	26	7	21	10	15	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	28	28	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	94	...	64	...	18	...	19	...	4	...	...	...	476	1	31	2	28	2	28	1	30	5	21	2	30	1	31	1	30	1	29	4	30	12	15	...	...
...	16	...	7	...	2	...	1	...	...	...	...	...	42	7	30	5	20	...	...	...	...	19	19	16	20	8	27	1	25	7	29	29	29	...	...	...	...
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...	4	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	26	28	...	...	...	...	...	...	18	23	...	...	...	...	...	...	...	...	...	...
...	389	...	275	...	36	...	28	...	24	...	4	...	1,080	6	31	1	28	1	30	1	24	1	19	8	30	1	31	1	31	1	29	2	29	1	28	1	25
...	...	...	15	...	5	...	...	...	...	...	...	...	45	18	25	4	13	1	14	...	...	...	...	...	...	...	...	5	30	1	10	...	...	...	...	...	...
...	...	...	23	...	...	...	...	...	...	...	...	...	51	1	28	...	...	30	30	...	...	...	...	...	...	...	...	1	30	...	...	...	...	...	...	...	...
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...	34	...	79	...	32	...	4	...	...	...	4	...	334	2	29	2	26	1	30	1	25	1	16	2	29	1	27	3	31	1	26	3	20	...	...	14	29
...	8	...	26	...	23	...	3	...	...	...	4	...	246	2	30	1	28	1	29	6	28	...	...	...	...	15	20	1	30	1	30	1	3	...	...	18	31
...	...	...	...	...	...	...	...	...	...	...	...	...	4	5	15	4	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	65	...	68	...	40	...	32	...	2	...	4	...	373	2	26	2	25	2	28	1	25	20	25	2	28	1	30	4	25	2	29	1	25	1	1	1	27
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	687	...	574	...	176	...	88	...	38	...	16	...	3,248	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	19	...	36	...	23	...	9	...	4	...	6	...	242	1	31	1	20	2	15	2	30	...	...	3	29	2	31	5	31	1	29	4	28	15	27	1	28
...	...	..	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	15	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	9	...	7	...	12	...	10	...	6	...	147	...	1,113	1	31	1	28	1	29	2	28	2	28	24	24	2	31	10	28	1	24	1	28	2	28	1	31
...	2	...	...	...	1	...	...	...	...	...	41	...	330	1	26	1	22	1	4	...	...	...	...	...	...	22	31	...	...	13	13	...	...	...	...	1	31
...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	3	1	12	5	1	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	12
...	...	...	...	...	1	...	...	...	...	...	3	...	33	15	20	6	28	1	1	...	...	...	...	...	...	...	...	...	...	10	10	...	...	...	...	20	20
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	4	...	20	...	16	...	4	...	15	...	61	...	339	1	31	3	27	4	31	1	24	25	25	23	23	21	29	13	31	1	29	2	19	1	29	1	31
...	5	...	1	...	9	...	1	...	109	...	321	...	623	1	30	1	28	6	30	10	25	23	13	...	...	1	21	7	7	1	30	23	23	1	30	1	31
...	...	...	...	...	...	...	...	...	...	..	...	...	1	8	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	7	...	1	...	43	...	4	...	5	...	4	...	240	2	29	1	28	1	31	2	25	...	...	21	21	2	23	25	25	1	30	2	17	3	20	2	25
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...	44	...	65	...	103	...	28	...	139	...	539	...	2,557	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	31	...	11	...	1	...	2	...	1	...	2	...	212	2	30	1	28	2	22	24	24	20	30	2	30	4	31	1	18	9	9	6	18	27	27	15	22
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	88	...	32	...	11	...	2	...	...	...	...	...	441	1	30	1	25	3	29	6	18	18	31	2	30	1	31	1	28	1	30	6	10	...	...	...	...
...	24	...	2	...	...	...	1	...	...	...	...	...	88	1	30	1	20	29	29	6	6	21	21	2	29	1	25	3	15	...	...	6	6	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	3	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	28	...	...	...	...	...	...	...	...

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c, (Talooks relative to Districts, and Towns relative to Talooks.)	Population according to last Census.	January. No. of Cases of Cholera reported.	January. No. of Deaths of Cholera reported.	February. No. of Cases of Cholera reported.	February. No. of Deaths of Cholera reported.	March. No. of Cases of Cholera reported.	March. No. of Deaths of Cholera reported.	April. No. of Cases of Cholera reported.	April. No. of Deaths of Cholera reported.	May. No. of Cases of Cholera reported.	May. No. of Deaths of Cholera reported.	June. No. of Cases of Cholera reported.	June. No. of Deaths of Cholera reported.
Tanjore.	Nunnilum, R. C, (Talook).	E. of District ...	190,940	...	525	...	102	...	7	...	27	...	19	...	8
	Negapatam, R. C. (Talook)	do, ...	165,801	...	230	...	94	...	25	...	22	...	34	...	162
	Negapatam M. T.	E. of Talook ...	33,095	...	19	...	4	...	1	...	...	...	1	...	4
	Nagoor, T.	do. ...	11,619	...	...	...	...	...	..	...	...	...	...	...	...
	Trivellore, T.	W. of Talook ...	7,340	...	20	...	36	...	15	...	12	...	...	...	...
	Tritrapundy, R. C, (Talook) ...	S. E. of District ...	128,336	...	183	...	30	...	3	...	...	...	11	...	51
	Mootoopotai, T.	E. of Talook ...	5,970	...	...	...	...	...	...	...	...	...	...	...	...
	Vatharniem, T.	S. E of do. ...	5,022	...	...	...	...	...	...	...	...	...	...	...	...
	Puttucottah, R. C. (Talook)	S. of District ...	196,960	...	41	...	46	...	19	...	11	...	1	...	6
	Adrampatam, T.	E. of Talook ...	5,409	...	...	...	...	...	...	...	...	...	...	...	...
	Tanjore, R. C. (Talook)	W. of District ...	300,808	...	707	...	367	...	90	...	84	...	10	...	11
	Tanjore, M. T. and C. Sn. ...	N. of Talook ...	36,941	...	58	...	25	...	10	...	1	...	2	...	...
	Tanjore, J.	......	177	...	...	...	...	...	...	...	...	...	...	...	...
	Tiruvadi, T.	N. of Talook ...	5,837	...	5	...	1	...	...	...	...	...	...	...	...
	Vullum, T.	N. E. of do. ...	6,573	...	7	...	20	...	4	...	2	...	...	...	...
	Malatur T.	E. of do. ...	6,023	...	...	...	...	...	...	...	...	...	...	...	...
	Iyempettah, T.	do. ...	7,621	...	...	...	...	...	...	...	...	...	...	...	...
	Combaconum, R. C. (Talook) ...	N. W. of District ...	310,184	...	1339	...	316	...	37	...	34	...	14	...	8
	Combaconum, M. T.	E. of Talook ...	29,283	...	88	...	18	...	...	...	1	...	2	...	1
	Moothiarjunnum, T.	do. ...	5,082	...	...	...	...	...	...	...	...	...	...	...	...
	Valengiman, T.	S, of do. ...	6,370	...	8	...	10	...	...	...	...	...	...	...	...
	Mannaargoody, R. C. (Talook) ...	Centre of District ...	147,777	...	407	...	115	...	15	...	34	...	71	...	40
	Mannaargoody, M. T.	do. of Talook ...	19,447	...	16	...	34	...	...	...	...	...	4	...	2
	Zemindaries	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total District...	......	1,731,703	...	3708	...	1119	...	216	...	218	...	175	...	392
Madura.	Dindigul, R. C. (Talook)	N. of District ...	274,383	...	1	...	...	...	80	...	37	...	14	...	64
	Dindigul, M. T.	Centre of Talook ...	8,951	...	...	...	...	...	3	...	3	...	...	...	...
	Butlakoonda, T.	......	8,651	...	...	...	...	...	2	...	...	...	1	...	2
	Iyempoliem, T.	......	9,336	...	...	...	...	...	...	...	...	...	1	...	...
	Authoor, T, ...	......	6,111	...	...	...	...	...	...	...	...	...	...	...	...
	Tuathanputty, ...	......	5,009	...	...	...	...	...	...	...	...	...	...	...	...
	Thadiathamboo, T.	......	6,979	...	...	...	...	...	...	...	...	...	...	...	...
	Adranoothoor, T.	......	7 596	...	...	...	...	...	...	...	...	...	...	...	...
	Meylur, R. C. (Talook)	Centre of District ..	112,983	...	2	...	11	...	20	...	28	...	17	...	65
	Keelavaloovoo, T.	......	5,218	...	...	...	...	...	9	...	2	...	5	...	...
	Karoongalagootly, T.	......	7,202	...	...	...	...	...	...	...	...	...	...	...	...
	Madura, R, C. (Talook)	Centre of District ...	202,781	...	4	...	45	...	35	...	31	...	36	...	34
	Madura, M T and C Sn.... ...	E. of Talook ...	39,872	...	...	...	16	...	...	...	6	...	4	...	2
	Madura, J.	......	230	...	...	...	...	1	1	...	...	...	...	...	...
	Sholavenden, T.	W. of Talook ...	6,000	...	...	...	...	...	...	...	...	...	...	...	...
	Tirumungalum, R. C. (Talook) ...	S. of District ...	214,840	...	10	...	5	...	60	...	119	...	93	...	184
	Tirumungalum, T.	E. of Talook ...	5,848	...	...	...	...	...	2	...	...	...	3	...	...
	Poothoor, T	......	6,055	...	...	...	...	...	36	...	24	...	1	...	1
	Elumalay, T.	......	5,463	...	...	...	...	...	...	...	...	...	...	...	2
	Caroomathoor, T	......	5,362	...	...	...	...	...	...	...	...	...	...	...	...
	Pereacolum, R. C. (Talook) ...	S. W. of District ...	180,187	...	...	...	...	..	10	...	3	...	133	...	95
	Pereacolum	N. of Talook ...	11,045	...	...	...	...	...	...	...	...	...	...	...	...
	Bodinaicknoor, T.	E. of do. ...	10,459	...	...	...	...	...	...	.	...	...	...	...	...
	Cumbum, T.	S, W. of do. ...	11,131	...	...	...	...	...	...	...	...	...	...	...	8
	Audiputty, T.	......	15,048	...	...	...	...	...	7	...	...	...	2	...	5
	Thengarai, T.	......	7,636	...	...	...	...	...	...	...	2	...	42	...	1
	Melanmungalum, T.	......	5,641	...	...	...	...	...	...	...	...	...	...	...	5
	Combay, T.	......	7,114	...	...	...	...	...	...	...	...	...	...	...	...
	Uthmapalliem, T.	......	5,822	...	...	...	...	...	...	...	1	...	1	...	6
	Thavaram, T.	......	6,176	...	...	...	...	...	...	...	...	...	2	...	...

in the Madras Presidency during the year 1870.

July		August		September		October		November		December		Total		January		February		March		April		May		June		July		August		September		October		November		December	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
...	19	...	25	...	9	...	6	...	2	...	...	...	749	1	31	1	25	1	24	1	30	2	29	2	30	3	31	1	28	2	28	4	8	13	15	...	...
...	128	...	62	...	32	...	7	...	5	...	1	...	802	1	30	1	28	1	30	1	26	1	30	2	30	1	31	1	31	1	26	2	15	6	19	6	6
...	33	...	32	...	15	...	...	...	...	...	...	...	109	1	30	4	18	31	31	...	...	25	25	6	27	4	31	1	30	1	17	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	82	11	30	1	28	1	30	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	39	...	12	...	26	...	7	...	...	...	9	...	371	1	31	1	24	1	24	...	...	8	31	1	29	1	30	5	30	1	29	1	20	...	...	6	28
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	19	...	9	...	7	...	3	...	3	...	...	...	165	1	27	1	27	10	31	2	29	11	11	8	28	1	27	1	18	17	29	1	28	15	17	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	...	7	...	7	...	9	...	3	...	33	...	1,329	1	31	1	28	1	31	1	30	8	26	3	28	6	6	13	24	3	28	1	28	7	16	1	31
...	...	...	...	...	...	...	...	...	...	...	...	...	96	1	31	1	28	9	26	14	14	9	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	1	...	...	...	...	...	...	...	...	...	7	17	30	7	7	...	...	...	...	...	...	...	...	...	...	20	20	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	33	16	31	3	27	2	20	14	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	16	..	15	...	7	...	8	...	4	...	5	...	1,803	1	31	1	28	1	23	1	29	2	29	2	30	4	30	1	28	4	24	4	30	15	25	1	30
...	3	...	5	...	1	...	2	...	1	...	1	...	123	1	29	2	26	...	...	10	10	10	19	5	5	10	20	1	28	11	11	10	22	1	15	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	18	1	27	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	16	...	3	...	10	...	1	...	...	...	...	...	712	1	31	1	28	1	30	1	30	1	29	1	27	1	17	1	29	2	25	31	31	...	...	...	...
...	2	...	...	...	...	...	...	...	...	...	...	...	58	1	31	2	27	...	...	...	...	6	27	3	14	2	3	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	357	...	176	...	110	...	45	...	18	...	50	...	6,584	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	54	...	181	...	129	...	79	...	47	...	43	...	729	4	4	...	...	1	29	1	27	1	30	1	30	1	31	1	31	1	29	1	31	1	30	1	30
...	1	...	6	...	16	...	4	...	...	...	15	...	48	...	...	...	...	1	20	10	13	...	...	...	...	5	5	12	31	2	25	21	30	...	...	9	28
...	12	...	13	...	...	...	...	...	...	...	...	...	30	...	...	...	...	20	21	...	...	22	22	26	27	1	29	2	20	...	...	...	...	...	...	...	...
...	2	...	1	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	23	23	...	...	20	26	9	29	...	...	...	...	...	...	...	...
...	...	...	17	...	8	...	...	...	...	...	...	...	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	28	4	25	...	...	...	...	...	...
...	...	...	18	...	...	...	...	...	...	...	...	...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	24	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	23	23	...	...
...	...	...	...	...	...	...	...	...	3	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	29	...	...
...	...	...	319	...	119	...	6	...	6	...	26	...	619	12	22	1	27	5	28	1	26	3	25	1	26	...	...	1	31	1	29	2	25	6	28	1	28
...	...	...	18	...	15	...	...	...	...	...	..	...	49	...	...	...	...	11	28	24	26	5	25	...	...	...	...	12	29	2	29	...	...	...	...	...	..
...	...	...	22	...	9	...	..	...	...	..	1	...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	23	7	23	...	...	...	...	19	19
...	12	...	361	...	288	...	88	...	70	...	126	...	1,130	15	24	1	28	1	27	2	28	1	30	1	30	2	22	1	30	1	30	1	30	1	29	2	31
...	2	...	160	...	120	...	19	...	9	...	38	...	376	...	...	...	...	...	...	...	...	23	30	9	25	7	09	4	31	1	30	1	29	9	25	3	31
...	...	...	...	1	1	...	...	1	...	2	2	5	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	4	...	3	...	...	...	1	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	26	23	26	...	...	12	12	...	...
...	113	...	119	...	126	...	73	...	61	...	27	..	990	4	26	2	26	1	31	1	30	1	30	2	30	2	29	1	31	1	30	1	29	1	29	4	30
...	4	...	...	...	...	...	...	...	...	...	...	...	9	...	.	...	...	2	5	...	...	1	25	...	...	14	20	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	3	...	1	...	1	...	1	...	68	...	...	...	...	1	31	1	11	17	17	15	15	...	...	...	...	20	27	20	20	20	20	12	12
...	...	...	14	...	18	...	3	...	...	...	...	...	37	...	...	...	...	...	...	...	...	...	...	13	14	...	...	1	19	4	31	1	14	...	...	...	...
...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	14	...	...	...	...	...	...	...	...
...	431	...	446	...	170	...	222	...	145	...	58	...	1,713	...	...	...	...	7	28	20	30	2	30	2	30	1	31	1	31	1	30	1	31	1	29	1	29
...	...	...	31	...	1	...	...	...	1	...	...	...	33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	29	6	6	...	...	25	25	...	...
...	1	...	9	...	2	...	...	...	7	...	...	...	19	...	...	...	...	...	...	...	...	...	...	...	...	23	23	7	23	...	...	...	...	14	29	...	...
...	73	...	13	...	...	...	...	...	...	...	...	...	94	...	...	...	...	...	...	...	...	...	...	2	25	1	30	4	10	...	...	...	...	...	...	...	...
...	...	...	14	...	3	...	30	...	...	...	...	...	61	...	...	...	...	7	11	...	...	2	25	20	28	...	.	1	19	5	15	1	18	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	45	...	...	...	...	...	...	20	21	2	23	2	2	...	..	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	2	10	...	...	...	...	...	...	...	...	...	...	...	...
...	13	...	...	...	23	...	...	...	...	...	...	...	36	...	...	...	...	...	...	...	...	...	...	...	...	15	20	...	...	1	4	...	...	...	...	...	...
...	36	...	...	...	1	...	...	...	...	...	...	...	45	...	...	...	...	...	...	29	29	2	2	22	28	1	31	...	...	7	7	...	...	...	...	...	...
...	6	...	35	...	...	...	11	...	4	...	...	...	58	...	...	...	...	...	...	...	...	25	27	...	...	3	10	1	30	...	...	3	30	2	22	...	...

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c. (Talooks relative to Districts, and Towns relative to Talooks.)	Population according to last Census.	January. No. of Cases of Cholera reported.	January. No. of Deaths of Cholera reported.	February. No. of Cases of Cholera reported.	February. No. of Deaths of Cholera reported.	March. No. of Cases of Cholera reported.	March. No. of Deaths of Cholera reported.	April. No. of Cases of Cholera reported.	April. No. of Deaths of Cholera reported.	May. No. of Cases of Cholera reported.	May. No. of Deaths of Cholera reported.	June. No. of Cases of Cholera reported.	June. No. of Deaths of Cholera reported.
Madura.—(*Concluded.*)	Pulni R. C. (Talook)	N. W. of District ...	161,534	...	1	...	9	...	118	...	57	...	14	...	89
	Pulni, T.	Centre of Talook ...	10,895	...	...	...	1	...	10	...	...	...	...	...	...
	Auzgoodi, T.	......	9,947	...	...	...	...	...	11	...	...	...	...	...	...
	Ramnad Zemindary												Returns not		
	Sevagunga Zemindary												Returns not		
	Total District ...	......	1,146,711	...	18	...	70	...	323	...	275	...	307	...	531
Tinnevelly.	Streevalliputtur, R. C. (Talook) ...	N. W. of District ...	154,719	...	...	...	...	...	3	...	21	...	34	...	30
	Soondrapolliem, T.	N. of Talook ...	7,794	...	...	...	...	...	...	...	...	...	1	...	...
	Streevalliputtur, T.	Centre of do. ...	12,941	...	...	...	...	...	...	...	...	...	...	...	...
	Mathavavilasem, T.	do. ...	7,306	...	...	...	...	...	...	...	...	...	...	...	1
	Rajahpolliem, T.	do. ...	12,989	...	...	...	...	...	...	...	...	...	...	...	...
	Settur, T.	S. W. of Talook ...	5,458	...	...	...	...	...	...	...	...	...	...	...	...
	Watrap, T.	N. W. of do. ...	13,539	...	...	...	...	...	...	...	...	...	...	...	2
	Satur, R. C. (Talook)	N. of District ...	145,016	...	1	...	6	...	10	...	22	...	97	...	79
	Verudiputty, T.	N. of Talook ...	5,196	...	...	...	2	...	1	...	1	...	2	...	1
	Sevakasi, T.	N. W. of do. ...	9,136	...	...	...	...	...	...	...	...	...	2	...	2
	Vembacottai, T.	......	5,199	...	...	...	...	...	...	...	...	...	...	...	...
	Ottapidaram, R. C. (Talook) ...	E. of District ...	246,637	...	2	...	2	...	8	...	40	...	124	...	204
	Tuticorin, M. T.	S. E. of Talook ...	9,544	...	...	...	...	...	1	...	1	...	11	...	19
	Tenkarai, R. C. (Talook)	S. E. of District .	218,245	...	...	...	12	...	201	...	118	...	483	...	406
	Tendirapiri, T.	N. of Talook ...	5,223	...	...	...	...	...	10	...	10	...	35	...	33
	Seruthunda Nulloor, T.	do. ...	5,571	...	...	...	6	...	7	...	2	...	...	...	1
	Tenkarai, T.	do. ...	8,018	...	...	...	...	...	1	...	...	...	10	...	32
	Streevykuntum, T.	do. ...	5,929	...	...	...	...	...	16	...	38	...	41	...	48
	Tenkarai Natnpooram, T. ...	do. ...	5,070	...	...	...	...	...	...	...	...	...	...	...	...
	Authoor, T.	N. E. of Talook ...	5,736	...	...	...	...	...	5	...	...	...	...	...	4
	Trichendoor, T.	E. of do. ...	5,340	...	...	...	...	...	...	...	...	...	2	...	...
	Koilpatam, T.	do. ...	6,815	...	...	...	...	...	...	...	...	...	25	...	14
	Kathrimolie, T.	S. E. of do. ...	8,162	...	...	...	...	...	5	...	...	...	9	...	18
	Tholappenparimai, T.	......	9,618	...	...	...	...	...	5	...	...	...	...	...	...
	Authimathapooram, T.	......	8,018	...	...	...	...	...	1	...	...	...	...	...	...
	Thirumaviludarapooram, T. ...	......	8,018	...	...	...	...	...	1	...	...	...	...	...	...
	Nangunery, R. C. (Talook)	S. of District ...	159,051	...	3	...	...	...	...	...	33	...	359	...	617
	Muliakaraiputty, T.	N. of Talook ...	5,971	...	1	...	...	...	...	...	...	...	...	...	2
	Vallioor, T.	Centre of do. ...	8,427	...	1	...	...	...	...	...	...	...	43	...	54
	Ambasamoodram, R. C. (Talook) ...	S. W. of District ...	149,323	...	...	...	...	...	2	...	85	...	325	...	238
	Valagasamoodram, T.	N. of Talook ...	7,432	...	...	...	..	...	...	...	1	...	7	...	1
	Viravanulloor, T.	E. of do. ...	11,352	...	...	...	...	...	...	...	4	...	7	...	3
	Ambasamoodram, T.	Centre of do. ...	7,521	...	...	...	...	...	...	...	...	...	61	...	3
	Kulladakurushi, T.	do. ...	11,362	...	...	...	...	...	...	...	29	...	33	...	5
	Shermadavy, T.	S. of Talook ...	7,679	...	...	...	...	...	...	...	...	...	1	...	1
	Ananthasamoodram, T. ...	.....	6,415	...	...	...	...	...	...	...	...	...	2	...	...
	Tenkasi, R. C. (Talook)	W. of District ...	109,685	...	...	...	2	...	1	...	65	...	53	...	39
	Chockemputty, T.	N. of Talook ...	5,167	...	...	...	...	...	...	...	...	...	...	...	...
	Kodyanalloor, T.	N. W. of do. ...	6,413	...	...	...	...	...	...	...	...	...	5	...	...
	Tenkasi, T.	W. of do. ...	9,606	...	...	...	...	...	...	...	33	...	9	...	5
	Kulasagaraputty, T.	S. of do. ...	6,050	...	...	...	...	...	...	...	...	...	...	...	...
	Sunkaranainar Covil, R. C. (Talook).	W. of District ...	158,222	...	...	...	1	...	2	...	13	...	22	...	27
	Ilavarasanemdal, T.	E. of Talook ...	14,162	...	...	...	1	...	...	...	..	...	1	...	2
	Kurivikolum, T.	S. E. of do. ...	5,639	...	...	...	...	...	...	...	...	...	...	...	...
	Sunkaranainar Covil, T... ...	Centre of do. ...	9,117	...	...	...	...	...	...	...	...	...	4	...	...
	Pooliengoodi, T	W. of do. ...	5,654	...	...	...	...	...	...	...	...	...	...	...	...
	Vasoothavanulloor, T.	do. ...	5,779	...	...	...	...	...	...	...	...	...	...	...	2
	Shenagiri, T.	N. of do. ...	10,938	...	...	...	...	...	...	...	..	...	...	...	...
	Theruvengadam, T.	E. of do. ...	7,277	...	...	...	...	...	...	...	...	...	3	...	...

in the Madras Presidency during the year 1870.

July.		August.		September.		October.		November.		December.		Total.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
...	11	...	19	...	101	...	11	...	1	...	44	...	475
...	...	..	11	...	83	...	...	...	...	...	7	...	112
...	...	...	...	...	...	...	...	...	...	...	...	...	11
re ceived													
re ceived													
...	621	...	1445	...	933	...	479	...	330	...	324	...	5,556
...	8	...	3	...	3	...	...	...	...	...	3	...	105
...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	7	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	1	...	...	...	...	...	...	...	...	...	3
...	30	...	26	...	67	...	15	...	...	...	24	...	377
...	3	...	4	...	8	...	...	...	...	...	5	...	27
...	...	...	...	...	1	...	...	...	...	...	1	...	6
...	...	...	...	...	1	...	...	...	...	...	...	...	1
...	161	...	36	...	33	...	..	...	2	...	16	...	628
...	25	...	...	...	1	...	...	...	...	...	...	...	56
...	356	...	243	...	72	...	16	...	2	...	28	...	1,937
...	16	...	...	...	...	...	...	...	...	...	9	...	113
...	14	...	4	...	6	...	1	...	...	...	...	...	41
...	8	...	...	...	...	...	...	...	...	...	...	...	51
...	...	...	...	...	...	...	...	...	...	...	...	...	143
...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	7	...	1	...	...	...	...	...	...	...	...	...	17
...	7	...	...	...	1	...	...	...	...	...	...	...	10
...	20	...	...	...	...	...	...	...	...	...	...	..	59
...	8	...	...	...	1	...	...	...	...	...	...	...	41
...	...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	..	...	...	...	...	...	1
...	323	...	149	...	170	...	92	...	21	...	140	...	1,907
...	12	...	...	...	...	...	...	..	...	...	...	...	15
...	21	...	6	...	...	...	...	...	...	.	16	...	141
...	76	...	15	...	4	...	5	...	2	...	112	...	864
...	...	...	...	...	...	...	...	...	...	...	5	...	14
...	23	...	...	...	...	...	1	...	...	...	9	...	47
...	...	...	...	...	1	...	...	...	...	...	4	...	69
...	...	...	1	...	...	...	...	...	...	...	4	...	72
...	2	...	2	..	...	...	...	...	...	...	22	...	28
...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	124	...	113	...	21	...	6	...	...	...	107	...	531
...	2	...	1	...	1	...	...	...	...	...	2	...	6
...	7	...	21	...	...	...	...	...	...	...	...	...	33
...	7	...	1	...	...	...	...	...	...	...	8	...	63
...	...	...	6	...	...	...	...	...	...	...	2	...	8
...	27	...	22	...	20	...	2	...	4	...	14	...	154
...	10	...	...	...	...	...	...	...	...	...	...	...	14
...	...	...	...	...	...	...	...	...	...	...	1	...	1
...	..	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	1	...	...	...	...	...	...	...	1
...	1	...	...	...	1	...	...	...	1	...	...	...	5
...	...	...	...	...	...	...	2	...	...	...	2	...	4
...	...	...	...	...	...	...	...	...	...	...	...	...	3

Total deaths (row key)	January.		February		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.	Date of first Case.	Date of last Case.
475	25	25	7	27	1	31	1	29	2	27	1	26	3	19	7	30	2	30	2	31	23	23	5	30
112	...	...	16	16	7	14	...	...	...	...	...	...	...	...	7	30	2	29	...	...	...	...	28	31
11	...	...	...	...	16	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5,556	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
105	...	...	...	...	9	16	3	28	1	29	1	28	1	21	6	28	4	17	...	...	...	...	3	16
1	...	...	.	...	...	...	...	...	27	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	4	21	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	17	17	...	...	6	6	...	...	...	...	...	...	...	...
377	20	20	3	26	1	30	1	28	1	26	1	30	3	31	1	31	1	30	3	28	...	...	2	31
27	...	...	18	25	7	7	28	28	8	31	3	3	5	10	12	27	10	29	...	...	...	...	6	29
6	...	...	...	...	...	...	...	...	1	1	25	26	...	...	...	...	8	8	...	...	...	...	10	10
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	19	...	...	...	...	...	...
628	25	26	12	28	1	21	2	30	1	30	1	29	1	31	2	30	1	23	...	...	6	6	10	24
56	...	...	...	...	...	...	...	...	13	31	1	30	6	30	...	...	28	28	...	...	...	...	...	...
1,937	...	...	20	28	1	31	1	30	1	31	1	30	1	29	1	31	1	29	1	30	3	28	2	31
113	...	...	...	...	1	28	1	30	1	30	1	29	9	29	...	...	...	...	...	...	...	...	12	31
41	...	...	20	26	15	30	10	10	...	...	25	25	4	14	17	27	1	16	21	21	...	..	...	..
51	...	...	...	...	31	31	...	...	...	...	2	29	1	11	...	...	...	...	...	...	...	...	...	...
143	...	...	...	...	22	31	1	30	2	30	1	30	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	15	29	...	...	..	..	2	25	1	23	15	15	...	...	...	...	...	...	...	..
10	...	...	...	...	...	...	...	...	12	13	...	...	8	27	...	...	10	10	...	...	...	...	...	...
59	...	...	...	...	...	...	...	...	19	31	2	26	1	25	...	...	...	...	...	...	...	...	...	...
41	...	..	...	...	3	23	...	...	1	30	4	30	19	27	...	...	7	7	...	...	...	...	...	...
5	...	...	...	...	5	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	29	29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	..	...	...	...	31	31	..	...	...	.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1,907	3	23	...	..	...	...	12	30	1	31	1	30	1	31	1	31	1	30	1	31	1	28	1	31
15	13	13	...	...	...	...	...	...	...	...	27	28	2	9	...	...	...	...	...	...	...	...	...	...
141	3	3	...	...	...	...	...	...	1	31	6	29	5	25	7	9	...	...	...	...	...	...	13	31
864	...	...	..	...	15	25	2	30	1	31	1	30	1	30	1	25	2	30	11	30	18	21	8	30
14	...	...	...	...	...	...	24	24	4	28	3	3	...	...	...	..	...	...	..	..	...	...	8	28
47	...	...	...	...	...	...	13	26	4	28	3	25	14	29	...	...	...	...	28	28	...	...	19	30
69	...	...	...	...	...	...	...	...	1	30	5	6	...	...	...	...	30	30	...	...	...	...	10	28
72	...	...	...	...	...	...	2	26	1	31	2	26	...	...	25	25	...	...	...	...	...	...	19	26
28	...	...	...	...	..	...	...	...	18	18	6	6	1	16	5	5	...	...	...	...	...	...	8	29
2	..	...	...	...	...	...	...	...	6	13	...	...	...	...	...	...	...	.	...	...	...	...	...	...
531	...	...	11	28	27	27	11	30	1	28	1	30	2	31	1	31	3	30	10	22	...	...	5	31
6	...	...	...	.	...	...	...	...	...	...	...	...	10	22	21	21	12	12	...	...	...	...	10	12
33	...	...	...	...	...	...	...	...	9	27	...	...	18	31	1	30	...	...	...	...	...	.	...	...
63	...	...	...	...	...	...	12	30	7	29	10	25	12	27	24	24	...	...	...	...	...	...	13	26
8	...	...	...	...	...	...	...	...	...	...	...	...	...	..	25	29	...	...	...	...	...	...	10	23
154	...	...	26	26	18	26	7	28	3	31	3	28	1	31	3	31	1	19	6	9	15	29	15	27
14	...	...	26	26	...	...	...	...	10	10	25	27	1	16	...	...	...	...	...	..	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	21
4	...	...	...	...	.	...	...	...	19	26	...	...	...	..	...	...	...	...	...	...	.	...	...	...
1	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	2	2	...	...	...	...	...	..
5	...	...	...	...	...	...	..	...	...	...	12	28	10	10	...	...	8	8	...	...	22	22	...	..
4	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	6	9	...	...	22	26
3	...	...	...	...	...	...	...	...	...	...	...	...	5	23	...	...	...	...	...	...	...	...	...	..

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c., (Talooks relative to Districts, and Towns relative to Talooks).	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
Tinnevelly.—(*Continued.*)	Tinnevelly, R. C. (Talook)	S. of District ...	183,121	...	2	...	23	...	31	...	240	...	224	...	271
	Tinnevelly, M. T.	W. of Talook ...	21,553	...	...	...	...	...	14	...	94	...	48	..	8
	Palamcottah, M. T. and C. Sn...	Centre of do. ...	13,315	..	...	...	1	...	...	...	20	...	7	...	2
	Palamcottah, J.	......	382	...	...	...	...	...	...	...	...	...	...	...	...
	Palamcottah, Troops, N. ...	......	565	...	...	...	...	...	...	...	...	...	1	...	...
	Narranganulloor, T.	W. of Talook ...	6,219	...	...	...	...	...	...	...	...	...	...	...	...
	Patai, T.	......	6,566	...	...	...	...	...	...	...	...	...	...	..	...
	Malapolliem, T.	S. of Talook ...	12,276	...	...	...	...	...	...	...	...	...	...	...	...
	Zemindaries	......	...	...	..	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,524,019	...	8	...	46	...	258	...	637	...	1721	...	1911
Kurnool.	Nundikotkur, R. C. (Talook) ...	N. of District ...	82,748	...	...	...	...	...	...	...	...	...	...	...	...
	Marakapur, R. C. (Talook)	N. E. of do. ...	78,266	...	...	...	...	...	...	...	...	...	...	...	...
	Cumbum, R. C. (Talook)	S. E. of do. ...	111,287	...	...	...	...	...	...	...	...	...	...	...	...
	Cumbum, M. T.	......	7,983	...	...	...	...	...	...	...	...	...	...	...	...
	Sirvelli, R. C. (Talook)	S. of District ...	63,409	...	...	...	...	...	...	...	...	...	...	...	...
	Koilkuntla, R. C (Talook)	do. ...	94,017	...	...	...	...	...	...	...	...	...	...	...	...
	Puttikondah, R. C. (Talook)... ...	W. of do. ...	133,586	...	...	...	...	...	...	...	...	...	...	...	...
	Mudikur, T.	S. W. of Talook ...	6,259	...	...	...	...	...	...	...	...	...	...	...	...
	Ramulcottah, R. C. (Talook) ...	W. of District ...	118,717	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool, M. T. and C. Sn. ...	N. of Talook ..	23,116	..	...	...	...	...	...	...	...	...	...	...	...
	Kurnool, J.	......	146	...	...	...	...	..	...	...	...	...	...	...	...
	Kurnool, Ct.	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kurnool, Troops, N.	......	687	...	...	...	...	...	...	...	...	...	...	...	...
	Nundial, R. C. (Talook)	Centre of District ...	88,827	...	...	...	...	...	...	...	...	...	...	...	...
	Nundial, T.	E. of Talook ...	7,465	...	...	...	...	...	...	...	..	...	...	...	...
	Zemindaries	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	770,857	...	...	...	...	...	...	...	...	...	...	...	...
Cuddapah.	Puddatoor, R. C. (Talook)	N. E. of District ...	85,486	...	...	...	...	..	...	...	...	...	...	...	...
	Puddatoor, T.	......	5,189	...	...	...	...	...	...	...	...	...	...	...	...
	Budwail, R. C. (Talook)	N. E. of District ...	75,224	...	...	...	...	...	...	...	...	...	...	...	...
	Budwail, T.	......	6,324	...	...	...	...	...	...	...	...	...	...	...	...
	Sidhout, R. C. (Talook)	E. of District ...	66,942	...	...	...	...	...	...	...	...	...	...	...	...
	Pullampett, R. C. (Talook)	S. E. of do. ...	114,796	...	...	...	...	...	...	...	...	...	6	...	12
	Voilpaud, R. C. (Talook)	S. of do. ...	128,093	...	...	...	...	...	...	...	...	...	20	...	21
	Royacotta, R. C. (Talook)	do. ...	105,186	...	...	...	...	...	...	...	..	...	...	...	...
	Madnapully, R. C. (Talook)... ...	do. ...	113,511	...	...	...	...	...	...	...	...	...	5	...	17
	Madnapully, T.	......	5,634	...	...	...	...	...	...	...	...	...	...	...	...
	Vampully, T.	......	5,540	...	...	...	...	...	...	...	...	...	...	...	..
	Kundukur, T.	......	6,735	...	...	...	...	...	...	...	...	...	...	...	...
	Kadri, R. C. (Talook)	S. W. of District ...	116,119	...	...	...	...	...	...	...	...	...	...	...	...
	Pulivendla, R. C. (Talook)	W. of do. ...	95,512	...	...	...	...	...	...	...	...	...	...	...	...
	Jamalamadugu, R. C. (Talook) ...	N. W. of do. ...	97,324	...	...	...	...	...	...	...	...	...	...	...	...

in the Madras Presidency during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
...	141	...	19	...	8	...	6	...	14	...	129	...	1,108	15	16	6	23	4	31	1	30	1	31	1	30	1	31	1	25	8	26	2	25	12	28	2	31
...	17	...	5	...	...	...	1	...	1	...	5	...	193	...	...	...	...	...	...	1	29	2	31	5	23	10	30	4	7	...	...	25	25	28	28	20	28
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...	1240	...	626	...	398	...	142	...	45	...	573	...	7,611	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c. (Talooks relative to Districts and Towns relative to Talooks.)	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
Cuddapah. (*Continued.*)	Cuddapah, R. C. (Talook)	Centre of District ...	146,566	...	..	...	...	...	...	...	...	...	...	...	...
	Cuddapah, M. T. and C. Sn. ...	E. of Talook ...	14,685	...	...	...	...	...	...	...	...	...	...	...	...
	Cuddapah, J.	......	226	...	...	...	...	...	...	...	...	...	...	...	...
	Zemindaries	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,144,759	...	...	...	...	...	...	...	...	...	31	...	50
Bellary.	Bellary, R. C. (Talook)	N. of District ...	129,627	...	...	...	...	...	...	...	...	...	...	...	...
	Bellary, M. T. and C. Sn. ...	S. of Talook ...	37,015	...	...	...	...	...	...	...	...	...	...	...	...
	Bellary, J.	......	384	...	...	...	...	...	...	...	...	...	...	...	...
	Bellary, Ct.	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bellary, Troops {E.	......	959	...	...	...	...	...	...	...	...	...	...	...	...
	Bellary, Troops {N.	......	1,752	...	...	...	...	...	...	.	...	...	...	...	...
	Ramandroog, Depot	......	49	...	...	...	...	...	...	...	...	...	...	...	...
	Adoni, R. C. (Talook)	N. E of District ...	139,629	...	...	...	...	...	...	...	...	...	...	...	...
	Kosey, T.	N. of Talook ...	5,263	...	...	...	...	...	...	...	...	...	...	...	...
	Adoni, M. T.	S. of do. ...	17,828	...	...	...	...	...	...	...	...	...	...	...	...
	Yemmayanoor, T.	......	6,243	...	...	...	...	...	...	...	...	...	...	...	...
	Alur, R. C (Talook)	N. E. of District ...	73,886	...	...	...	...	...	...	...	...	...	...	...	...
	Ghooty, R. C. (Talook)	E. of do. ...	103,121	...	...	...	...	...	...	...	...	...	...	...	...
	Ornakunda, T.	N. E. of Talook ...	5,595	...	...	...	...	...	...	...	...	...	...	...	...
	Pomundu, T.	S. of do. ...	5,004	...	...	...	...	...	...	...	...	...	...	...	...
	Ghooty, M. T.	......	4,097	...	...	...	...	...	...	...	...	...	...	...	...
	Tadpatri, R. C. (Talook)	E. of District ...	105,385	...	...	...	...	...	...	...	...	...	...	...	...
	Yedaki, T.	Centre of Talook ...	6,504	...	...	...	...	...	...	...	...	...	...	...	...
	Tadpatri, T.	E. of do. ...	7,869	...	...	...	...	...	...	...	...	...	...	...	...
	Anantapoor, R. C. (Talook)... ...	E. of District ...	85,052	...	...	...	...	...	...	...	...	...	...	...	...
	Anantapoor, M. T.	......	4,426	...	...	...	...	...	...	...	...	...	...	...	...
	Hospett, R. C. (Talook)	W. of District ...	74,431	...	...	...	...	...	...	...	...	...	...	...	...
	Kumbli, T.	N. E. of Talook ...	9,227	...	...	...	...	...	...	...	...	...	...	...	...
	Hospett, T.	W. of do. ...	9,419	...	...	...	...	...	...	...	...	...	...	...	...
	Dharmaveram, R. C. (Talook) ...	S. of District ...	96,284	...	...	...	...	...	...	...	...	...	...	...	...
	Dharmaveram, T.	E. of Talook ...	5,419	...	..	...	...	...	...	...	...	...	...	...	...
	Pennakonda, R. C. (Talook) ...	S. of District ...	75,463	...	...	...	...	...	...	...	...	...	...	...	...
	Hindupur, R. C. (Talook)	S. of do. ...	71,978	...	..	...	...	..	...	...	...	...	...	...	...
	Madakasera, R. C. (Talook)... ...	S. of do. ...	60,592	...	...	...	...	...	...	...	...	...	...	...	...
	Royadroog, R C. (Talook)	W. of do. ...	65,453	...	...	...	...	...	...	...	...	...	...	...	...
	Royadroog, T.	S. of Talook ...	5,971	...	...	...	...	...	...	...	...	...	...	...	...
	Kudlighee, R. C. (Talook)	N. W. of District ...	74,217	...	...	...	...	..	...	...	...	...	...	...	...
	Hurpunhulli, R. C. (Talook)... ...	N. W. of do. ...	62,869	...	...	...	...	...	...	...	...	...	...	...	...
	Hurpunhulli, T.	Centre of Talook ...	6,308	...	...	...	...	...	...	...	...	...	...	...	...
	Huvenhudgullee, R. C. (Talook) ...	N. W. of District ...	73,945	...	...	...	...	...	...	...	...	...	...	...	...
	Zemindaries	......	13,012	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,304,944	...	...	...	...	...	...	...	...	...	...	..	...
North Arcot.	Chendragherri, R. C (Talook) ...	N. of District ...	91,275	...	...	...	14	...	1	...	...	...	67	...	58
	Tripaty, T.	E. of Talook ...	8,598	...	...	...	...	...	...	...	...	...	19	...	31
	Wallajahpett, R. C. (Talook) ...	E. of District ...	191,851	...	8	...	5	...	5	...	1	...	133	...	181
	Wallajahpett, M. T.	S. W. of Talook ...	10,993	...	...	...	...	...	...	...	...	...	3	...	3
	Cauverepauk, T.	N. of do. ...	5 074	...	...	...	...	...	...	...	...	...	...	...	23

in the Madras Presidency during the year 1870.

July		August		September		October		November		December		Total		January		February		March		April		May		June		July		August		September		October		November		December	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. f Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
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Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c. (Talooks relative to Districts, and Towns relative to Talooks.)	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
North Arcot.—(*Continued.*)	Wandewash, R. C. (Talook)	S. of District ...	133,982	...	4	...	3	...	2	...	...	...	98	...	28
	Arcot, R. C. (Talook)...	S. E. of do. ...	141,572	...	25	...	25	...	26	...	32	...	82	...	85
	Arcot	N. of Talook ...	9,189	...	...	...	...	...	11	...	6	...	3	...	2
	Vellore, R. C. (Talook)	S. W. of District ...	148,412	...	2	...	4	...	7	...	7	...	43	...	30
	Pettamoor, T.	N. of Talook ...	8,987	...	...	...	...	...	...	...	...	...	7	...	...
	Vellore, M. T.	N. E. of do. ...	30,529	...	2	...	...	...	...	...	...	...	...	...	2
	Vellore J.	......	728	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore, Ct.	......	2,666	...	..	...	...	...	...	...	...	...	...	...	...
	Vellore, troops {E.	......	3	...	...	...	...	...	...	...	...	...	...	...	...
	Vellore, troops {N.	......	553	...	...	...	...	...	...	...	...	...	...	...	...
	Polur, R. C. (Talook)...	S. W. of District ...	92,974	...	19	...	8	...	4	...	3	...	68	...	18
	Polur, T.	E. of Talook ...	5,614	...	...	...	...	...	...	...	...	...	...	...	...
	Gudiathum, R. C. (Talook)	S. W. of District ...	135,233	...	3	...	1	...	27	...	33	...	29	...	35
	Gudiathum, T.	S. of Talook ...	12,806	...	...	...	...	...	...	...	...	...	1	...	...
	Palmanair, R. C. (Talook)	W. of District ...	53,072	...	...	...	...	...	2	...	...	...	9	...	8
	Chittoor, R. C. (Talook)	N. W. of do. ...	193,436	...	...	...	7	...	14	...	...	...	72	...	56
	Chittoor, C. Sn.	Centre of Talook ...	9,797	...	...	...	...	...	...	...	...	...	...	...	...
	Chittoor, J.	......	291	...	...	...	...	...	...	...	...	...	...	...	...
	Zemindaries	......	598,809	...	22	...	35	...	10	...	23	...	334	...	400
	Calastry, T.	N. E. of District ...	9,651	...	...	...	...	...	...	...	...	...	...	...	...
	Carvetnuggrum, T.	do. ...	5,884	...	...	...	...	...	...	...	...	...	1	...	...
	Poonganoor, T.	N. W. of do. ...	8,088	...	...	..	...	...	...	...	...	...	...	...	35
	Arnee, T.	S. do. ...	10,865	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,780,616	...	83	...	102	...	98	...	99	...	935	...	899
Salem.	Kistnagherry, R. C. (Talook) ...	N. of District ...	132,515	...	95	...	63	...	67	...	13	...	...	...	28
	Kistnagherry, T...	Centre of Talook ...	6,758	...	...	...	...	...	...	...	...	...	...	...	...
	Tripatoor, R. C. (Talook)	N. E. of District ...	151,845	...	43	...	105	...	5	...	1	...	13	...	30
	Tripatoor, T.	W. of Talook ...	10,381	...	...	...	...	...	...	...	...	...	3	...	94
	Vaniembady, T.	E. of do. ...	12,357	...	...	...	..	...	...	...	...	...	...	...	...
	Utenghery, R. C. (Talook)	E. of District ...	127,084	...	...	...	1	...	11	...	8	...	6	...	15
	Athoor, R. C. (Talook)	S. E. of do. ...	126,814	...	28	...	41	...	47	...	5	...	12	...	1
	Athoor, T...	Centre of Talook ...	6,083	...	...	...	3	...	9	...	...	...	...	...	...
	Namacal, R. C. (Talook)	S. of District ...	222,784	...	24	...	1	...	1	...	48	...	2	...	1
	Shunthiamungalum, T.	N. of Talook ...	8,563	...	...	...	...	...	...	...	...	...	...	...	...
	Salem, R. C. (Talook)	W. of District ...	317,784	...	268	...	145	...	82	...	64	...	83	...	62
	Salem, M. T. and C. Sn... ...	E. of Talook ...	33,072	...	30	...	13	...	2	...	...	...	15	...	...
	Salem, J.	......	466	...	...	...	...	...	...	...	...	...	...	...	...
	Razipur, T.	S. of Talook ..	7,146	...	...	...	...	...	1	...	...	...	...	...	...
	Trichengode, R. C. (Talook) ...	S. W. of District ...	209,803	...	97	...	43	...	19	...	19	...	8	...	...
	Dharampoory, R. C. (Talook) ...	N. W. of do. ...	161,067	...	...	...	24	...	30	...	30	...	5	...	16
	Oossoor, R. C. (Talook)	do. ...	169,537	...	5	...	20	...	9	...	27	...	2	...	53
	Oossoor, T.	N. W. of Talook ...	5,193	...	...	...	...	..	...	...	...	...	...	...	...
	Zemindaries	.. ...	...	...	...	...	..	...	...	...	...	...	...	...	...
	Total District ...	......	1,619,233	...	560	...	443	...	271	...	215	...	141	...	206
Coimbatore.	Suthiamungalam, R. C. (Talook) ...	N. of District ...	140,161	...	11	...	7	...	19	...	28	...	...	...	...
	Numbyoor, T.	S. of Talook ...	5,140	...	...	...	...	...	...	...	...	...	...	...	...
	Seravaloor, T.	......	5,953	...	...	...	...	...	1	...	...	...	...	...	...

in the Madras Presidency during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
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...	2	...	...	...	...	...	...	...	...	...	...	...	24	..	...	...	...	19	31	1	28	6	13	17	19	24	30	...	...	...	...	...	..	...	...	...	...
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...	44	...	59	...	45	...	39	..	44	..	15	...	374	22	29	2	2	3	31	1	30	2	31	2	29	2	31	1	30	1	30	1	29	1	29	1	29
...	17	...	...	...	8	...	13	...	8	...	1	...	48	...	...	...	...	...	...	...	...	14	14	...	...	4	25	...	...	11	22	2	26	6	29	2	2
...	1	...	9	...	4	...	1	...	7	...	...	...	41	...	...	...	...	10	13	...	...	4	25	2	6	3	3	1	27	3	28	31	31	3	17	...	...
...	18	...	51	...	27	...	23	...	74	...	22	...	364	...	...	22	26	1	28	...	...	3	30	1	30	1	26	1	31	6	30	2	28	3	30	1	22
...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	93	...	99	...	15	...	19	...	53	...	42	...	1,145	8	31	5	28	1	15	2	30	1	31	1	30	1	31	1	28	1	28	1	30	2	30	1	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	334	...	389	..	176	...	113	...	227	...	140	...	3,595	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	128	...	68	...	29	...	24	...	8	...	18	...	541	1	31	1	28	1	30	1	27	...	...	5	24	1	31	1	31	1	30	3	28	11	16	1	25
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	..
...	258	...	102	...	20	...	13	...	...	...	8	...	598	1	30	1	28	10	28	12	12	12	31	1	28	1	30	1	30	1	29	1	24	...	...	2	21
..	5	...	...	...	...	...	..	...	..	...	...	...	102	...	...	...	...	...	...	...	...	20	27	1	27	2	5	...	...	...	...	...	...	...	...	...	...
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...	8	...	26	...	35	...	...	...	8	...	16	...	134	...	...	24	24	5	31	3	27	3	7	2	16	6	30	1	29	1	28	...	...	14	25	3	31
...	12	...	38	...	16	...	...	...	...	...	35	...	235	1	31	2	28	1	31	3	29	7	25	5	5	1	26	1	30	1	29	...	...	...	..	1	3
...	...	...	...	...	1	...	...	...	...	...	7	...	20	...	...	25	26	2	31	...	..	...	...	...	...	...	...	...	...	1	1	...	...	...	...	24	31
...	5	...	14	...	11	...	9	...	14	...	230	...	360	7	26	8	8	7	7	3	24	23	26	15	15	10	31	2	26	3	29	1	22	4	22	2	15
...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	30	30
...	28	...	139	...	24	...	10	...	...	...	5	...	920	2	31	1	28	1	31	1	30	10	31	1	30	1	29	1	30	1	29	4	31	...	...	21	25
...	18	...	19	...	1	...	...	...	...	...	...	...	98	10	25	2	23	1	6	...	...	10	29	...	...	3	30	2	18	8	8	...	...	...	...	...	...
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...	2	...	76	...	26	...	12	...	2	...	1	...	305	3	31	1	27	2	31	1	22	9	20	...	...	12	25	1	21	1	29	4	27	19	21	26	26
...	9	...	15	...	9	...	1	...	8	...	6	...	153	...	...	1	21	1	30	1	25	5	31	4	25	9	31	1	23	3	29	1	1	4	25	7	28
...	117	...	43	...	2	...	...	...	...	...	...	...	278	2	25	17	28	1	28	4	25	26	28	2	29	1	30	1	18	1	14	...	...	...	...	...	...
...	25	...	...	...	...	...	...	...	...	...	...	...	25	...	...	...	...	...	...	...	...	...	...	...	...	3	30	...	...	...	...	...	...	...	...	...	...
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...	567	...	521	...	172	...	69	...	40	...	319	...	3,524	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	...	1	...	4	...	12	...	3	...	...	...	86	16	27	1	24	7	31	1	25	...	...	...	...	18	18	13	13	3	29	1	27	12	28	...	...
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...	...	...	...	...	2	...	...	...	...	...	...	...	3	...	...	...	...	7	17	...	...	...	...	...	...	...	...	...	...	29	29	...	...	...	...	...	...

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c. (Talooks relative to Districts, and Towns relative to Talooks.)	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
Coimbatore.—(*Continued.*)	Collegal, R. C. (Talook)	N. of District ...	58,851	...	...	...	1	...	...	...	1	...	...	...	...
	Collegal, T.	N. W. of Talook ...	5,634	...	...	...	...	...	...	...	...	...	...	...	...
	Bhowany, R. C. (Talook)	E. of District ...	74,031	...	2	...	38	...	2	...	...	...	...	...	2
	Perindorai, R. C. (Talook)	do. ...	181,008	...	2	...	7	...	36	...	37	...	6	...	1
	Perindorai, T.	do. ...	5,092	...	...	...	...	...	2	...	...	...	...	...	...
	Errode, T.	do. ...	7,225	...	...	...	...	...	12	...	...	...	...	...	...
	Caroor, R. C. (Talook)	S. E. of District ...	137,536	...	...	...	1	...	35	...	52	...	23	...	1
	Caroor, T...	N. E. of Talook ...	9,271	...	...	...	...	...	...	...	...	...	...	...	...
	Pullaputty, T.	S. E. of do. ...	5,012	...	...	...	...	...	...	...	...	...	...	...	...
	Aravakoorchy, T...	......	7,540	...	...	...	...	...	...	...	1	...	...	...	...
	Thonnelay, T.	......	6,265	...	...	...	...	...	...	...	...	...	4	...	...
	Dharapooram, R. C. (Talook) ...	S of District ..	174,662	...	10	...	27	...	78	...	44	...	17	...	...
	Dharapooram, T...	S. of Talook ...	6,961	...	...	...	...	...	9	...	18	...	...	...	...
	Moolanoor, T.	......	5,648	...	...	...	...	...	...	...	1	...	...	...	...
	Nerlumboor, T.	......	5,276	...	...	...	...	...	...	...	...	...	1	...	...
	Oodamalapettah, R. C. (Talook) ...	S of District ...	97,531	...	57	...	3	...	2	...	4	...	...	...	...
	Oodamalapettah, T.	S. E. of Talook ...	5,675	...	...	...	...	...	...	...	...	...	...	...	...
	Pollachy, R. C. (Talook)	S. W. of District ...	133,234	...	...	...	1	...	15	...	6	...	...	...	1
	Annamalay, T.	Centre of Talook ...	10,445	...	...	...	...	...	...	...	...	...	...	...	...
	Coimbatore, R. C. (Talook)	W. of District ...	193,985	...	...	...	12	...	...	...	16	...	1	...	...
	Coimbatore, M. T. and C. Sn. ...	S. E. of Talook ...	25,324	...	...	...	...	...	...	...	...	...	...	...	...
	Coimbatore, J.	......	1,061	...	...	...	...	...	...	1	...	...	...	...	...
	Singananulloor, T.	S. E. of Talook ...	6,519	...	...	...	...	...	...	...	...	...	...	...	...
	Kumamatoor, T.	do. ...	5,246	...	...	...	...	...	...	...	...	...	...	...	...
	Palladom, R. C. (Talook)	......	202,583	...	...	...	...	...	4	...	5	...	13	...	...
	Zemindaries	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,393,582	...	82	...	97	...	191	...	193	...	60	...	5
Neilgherries.	Neilghorry, R. C. (Talook)	......	38,142	...	...	...	...	...	...	...	...	...	...	...	...
	Ootacamund, M. T. and C. Sn. ...	Centre of District ...	11,949	...	...	...	...	...	...	...	...	...	...	...	...
	Ootacamund, J.	......	246	...	...	...	...	...	...	...	...	...	...	...	...
	Lawrence Asylum, J.	......	243	...	...	...	...	...	...	...	...	...	...	...	...
	Wellington, Ct.	......	1,004	...	...	...	...	...	...	...	...	...	...	...	...
	Wellington, Troops, E.	......	420	...	...	...	...	...	...	...	...	...	...	...	...
	Coonoor, M. T.	......	4,014	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	38,142	...	...	...	...	...	...	...	...	...	...	...	...
South Canara.	Kundapoor, R. C. (Talook)	N. of District ...	106,478	...	1	...	3	...	1	..	...	...	...	...	...
	Udipi, R. C.	do. ...	208,218	...	5	...	2	...	...	...	1	...	...	...	...
	Tansekusbah, T.	N. of Talook	5,031	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore, R. C. (Talook)	Centre of District ...	213,832	...	6	...	1	...	1	...	1	...	3	...	4
	Mangalore, M. T. and C. Sn, ...	S. W. of Talook ...	23,668	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore, J.	......	146	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore, Ct.	......	1,905	...	...	...	...	...	...	...	...	...	...	...	...
	Mangalore, Troops, N.	......	700	...	...	...	...	...	...	...	...	...	...	...	...
	Uppanangadi, R. C. (Talook) ...	E. of District ...	103,517	...	2	...	1	...	...	...	1	...	...	...	1
	Kassergode, R. C. (Talook)	S. of do. ...	203,974	...	3	...	1	...	1	...	2	...	2	...	2
	Aginur, T.	S. E. of Talook ...	5,407	...	1	...	...	...	...	...	...	...	...	...	...
	Tricarpoor, T.	do. ...	5,681	...	...	...	...	...	...	...	...	...	...	...	...
	Neleshwar, T.	S. of do. ...	8,087	...	...	...	...	...	...	...	...	...	...	...	...
	Zemindaries	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	8,36,019	...	...	17	...	8	...	3	...	5	...	5	...	7

in the Madras Presidency during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera reported	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
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...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	7	...	...	...	3	...	3	...	...	...	4	...	61	10	12	1	27	5	25	...	...	...	...	22	27	2	18	...	...	7	26	1	14	...	...	5	13
...	3	...	8	...	33	...	71	...	70	...	22	...	296	5	10	10	22	2	30	1	26	15	21	30	30	1	27	4	18	1	30	1	29	1	30	1	30
...	...	...	...	...	...	...	...	...	...	...	9	...	11	...	...	...	...	7	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	30
...	...	...	...	...	12	...	3	...	...	...	...	...	27	...	...	...	...	23	30	...	...	...	...	...	...	...	...	...	...	1	28	3	7	...	...	..	...
...	...	...	...	...	20	...	69	...	29	...	64	...	294	...	...	18	18	18	29	1	28	1	29	16	16	..	...	...	...	7	29	2	30	1	30	1	28
...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	4	...	2	...	16	...	105	...	80	...	44	...	427	3	26	2	20	2	31	1	29	1	30	...	...	4	13	24	24	1	30	1	28	1	29	1	26
...	...	...	...	...	...	...	4	...	...	...	1	...	32	...	...	...	...	20	30	5	29	...	...	...	...	...	...	...	...	...	...	5	28	...	...	26	26
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...	1	...	3	...	2	...	43	...	16	...	8	...	139	1	28	1	23	18	22	7	19	...	...	...	...	22	28	1	24	29	30	1	31	9	28	24	29
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	37	...	61	...	32	...	65	...	15	...	233	...	...	16	16	15	28	2	8	...	...	12	12	...	...	4	29	1	30	1	30	1	29	1	26
...	...	...	...	...	10	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	26	...	...	...	...	...	...
...	1	...	8	...	84	...	15	...	105	...	58	...	300	...	...	1	9	...	...	1	21	22	22	...	...	21	21	2	29	2	30	1	30	1	31	1	26
...	...	...	...	...	2	...	...	...	3	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16	17	...	...	24	30	...	...
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...	..	...	1	..	41	...	270	...	78	...	68	...	480	...	...	...	...	19	23	13	29	1	8	...	...	...	...	25	25	1	30	1	31	1	29	1	29
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	11	...	8	...	7	...	10	...	4	...	5	...	56	6	27	12	18	...	...	2	2	...	...	...	...	2	27	4	29	4	28	1	26	1	20	20	29
...	...	...	...	...	...	...	...	...	1	..	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	20	20
...	14	...	15	...	9	...	7	...	10	...	6	...	77	2	26	15	15	26	26	4	4	5	18	10	26	1	20	2	27	13	22	1	26	1	24	4	21
...	4	...	1	...	2	...	2	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	11	21	4	4	11	21	1	3	...	...	..	...
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...	10	...	7	...	15	...	7	...	5	...	16	...	71	3	27	10	10	16	16	24	24	29	30	15	26	4	19	1	30	2	27	4	27	1	28	1	28
...	...	...	...	...	...	...	...	...	...	...	...	...	1	27	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	45	...	43	...	42	...	35	...	25	...	32	...	267	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c., (Talooks relative to Districts, and Towns relative to Talooks.)	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
Malabar.	Cherical, R. C. (Talook)	N. of District. ...	214,612	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore, M. T...	S. W. of Talook ...	6,011	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore, J.	......	510	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore, Ct.	......	9,858	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore, Troops, { E. ...	......	663	...	...	...	...	...	...	...	...	...	...	...	...
	Cannanore, Troops, { N. ..	......	1,213	...	...	...	...	...	...	...	...	...	...	...	...
	Cherical, T.		5,581	...	...	...	...	...	...	...	...	...	...	...	...
	Kotyam, R. C. (Talook)... ...	N. of District ...	122,789	...	...	...	...	...	1	...	...	...	...	...	...
	Tellicherry, M. T.	......	17,726	...	...	...	...	...	...	...	...	...	...	...	...
	Tellicherry, J.	......	93	...	...	...	...	...	...	...	...	...	...	...	..
	Tadivoor T.	......	5,603	...	...	...	...	...	...	...	...	...	...	...	...
	Wynaad, R. C. (Talook)	Centre of District ...	56,603	...	...	...	...	...	1	...	...	...	...	...	...
	Poothadi T.	......	6,183	...	...	...	...	...	1	...	...	...	...	...	...
	Kurumbranad R. C. (Talook) ...	Centre of District ...	203,549	...	1	...	...	...	...	...	...	...	...	...	...
	Melady, T.	......	6,309	...	...	...	...	...	...	...	...	...	...	...	...
	Vyur, T.	......	6,918	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut, R. C. (Talook)	Centre of District ...	160,400	...	...	...	...	...	...	...	1	...	2	...	...
	Calicut, M. T. and C. Sn. ...	W. of Talook ...	36,602	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut, J.	......	159	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut, Ct.	......	105	...	...	...	...	...	...	...	...	...	...	...	...
	Calicut, Troops, E.	......	64	...	...	...	...	...	...	...	...	...	...	...	...
	Malliapooram, Troops, E. ...	......	79	...	...	...	...	...	...	...	...	...	...	...	...
	Kunnamungalum, T.	......	5,188	...	...	...	...	...	...	...	1	...	1	...	...
	Ernad, R. C. (Talook)	S. of District ...	240,675	...	3	...	2	...	...	...	5	...	2	...	7
	Munjeri, T.	......	6,612	...	3	...	1	...	...	...	...	...	...	...	...
	Valakalam, T.	......	6,952	...	...	...	...	...	...	...	...	...	...	...	1
	Niambra, T.	......	7,448	...	...	...	...	...	...	...	...	...	...	...	...
	Tricolum T.	......	6,370	...	...	...	...	...	...	...	...	...	...	...	...
	Kotuveyur, T.	......	6,543	...	...	...	...	...	...	...	...	...	...	...	...
	Valavanad, R. C. (Talook)	S. of District ...	246,752	...	1	...	1	...	3	...	3	...	...	...	12
	Ungadipooram, T.	......	6,335	...	...	...	1	...	1	...	...	...	...	...	...
	Chinnagoodoo, T.	......	6,602	...	...	...	...	...	...	...	...	...	...	...	11
	Perindalanava, T.	......	5,243	...	...	...	...	...	...	...	...	...	...	...	...
	Cochin, R. C. (Talook)	S. of District ...	11,123	...	...	...	...	...	...	...	...	...	...	...	...
	Cochin, M. T.	S. of Talook ...	9,940	...	...	...	...	...	...	...	...	...	...	...	...
	Cochin, J.	......	17	...	...	2	...	...	...	...	...	1	...	...	...
	Trichoor Troops N.	......	167	...	...	1	...	...	...	...	...	...	...	...	...
	Quilon ,, ...	......	447	...	...	...	...	...	...	...	...	...	...	...	..
	Trevandrum ,, ...	......	79	...	...	...	...	...	...	...	...	...	...	...	...
	Palghaut, R. C. (Talook)	S. of District ...	279,303	...	...	...	1	...	22	...	24	...	73	...	179
	Palghaut, M. T.	N. of Talook ...	27,533	...	...	...	...	...	1	...	1	...	16	...	28
	Kottaya, T.	......	7,985	...	...	...	1	...	...	...	2	...	1	...	4
	Ellapalli, T.	......	9,313	...	...	...	...	...	3	...	5	...	...	...	...
	Pallathiri, T.	......	5,520	...	...	...	...	...	6	...	4	...	...	...	...
	Pallathulli, T.	......	5,756	...	...	...	...	...	3	...	...	...	...	...	1
	Vatavanur, T.	......	6,219	...	...	...	...	...	1	...	...	...	...	...	...
	Moodoora, T.	......	6,631	...	...	...	...	...	...	...	1	...	...	...	...
	Kongada, T.	......	5,643	...	...	...	...	...	...	...	2	...	...	...	...
	Edathara, T.	......	6,496	...	...	...	...	...	...	...	1	...	1	...	4
	Agathathara, T.	......	5,605	...	...	...	...	...	...	...	...	...	8	...	2
	Kodunoyur, T.	......	12,294	...	...	...	...	...	...	...	...	...	...	...	3
	Tangara, T.	......	7,414	...	...	...	...	...	...	...	...	...	...	...	4
	Shoolamur, T.	......	6,604	...	...	...	...	...	...	...	...	...	...	...	2
	Tharoor, T.	......	5,360	...	...	...	...	...	...	...	...	...	...	...	1
	Kushalmaniem, T.	......	5,203	...	...	...	...	...	...	...	...	...	...	...	2
	Kuthanur, T.	......	5,133	...	...	...	...	...	...	...	...	...	...	...	4
	Pullassana, T.	......	5,422	...	...	...	...	...	...	...	...	...	...	...	1
	Vattagogeri, T.	......	7,724	...	...	...	..	...	..	...	...	...	...	...	...
	Kunnanurpattola, T.	......	7,762	...	...	...	...	...	...	...	...	...	...	...	...
	Poothoor, T.	......	8,957	...	...	...	...	...	...	...	...	...	...	...	...
	Vuluthee, T.	......	5,520	...	...	...	...	...	...	...	...	...	...	...	...

in the Madras Presidency during the year 1870.

July.		August.		September.		October.		November.		December.		Total.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.	Date of first case.	Date of last case.
...	3	...	...	...	...	...	...	...	5	...	27	...	35	...	...	...	...	...	...	...	...	...	...	...	...	14	27	...	...	...	...	...	...	9	17	3	31
...	...	...	...	...	...	...	...	...	...	...	13	...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	29
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	1	...	1	...	3	...	...	...	...	9	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	21	29	29
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	2	...	...	...	...	...	...	...	3	...	...	...	...	31	31	...	...	...	...	...	...	...	...	...	...	5	12	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	1	...	...	...	5	5	26	15	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	17	...	...
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...	8	...	5	...	13	...	12	...	23	...	14	...	95	24	24	16	16	21	28	6	17	...	...	2	26	12	29	26	31	7	28	1	25	2	28	2	28
...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	16	16	21	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	3	...	1	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	19	21	21
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...	112	...	93	...	34	...	34	...	17	...	85	...	674	...	...	21	21	18	30	1	29	5	31	2	30	2	31	1	31	1	30	1	31	1	27	2	31
...	21	...	31	...	16	...	7	...	...	...	...	...	121	...	...	...	...	30	30	21	21	5	30	1	30	4	31	1	31	3	30	1	18	...	...	...	...
...	5	...	2	...	...	...	...	...	...	...	...	...	15	...	...	21	21	...	...	16	20	13	13	17	26	7	25	8	13	...	...	...	...	...	...	...	...
...	...	...	2	...	...	...	...	...	...	...	13	...	23	...	...	...	...	28	30	1	12	...	...	...	...	...	...	18	23	...	...	...	...	...	...	10	30
...	...	...	...	...	...	...	...	...	...	...	4	...	14	...	...	...	...	18	26	4	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	17
...	...	...	...	...	...	...	1	...	...	...	7	...	22	...	...	...	...	26	26	...	...	...	...	26	26	...	...	...	...	...	...	10	10	...	...	13	29
...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	22	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	22	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	1	...	2	...	...	...	...	...	...	...	5	...	...	...	...	...	...	6	10	...	...	...	...	...	...	14	14	1	20	...	...	...	...	...	...
...	3	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	16	16	22	22	6	30	25	27	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	6	...	10	...	...	...	...	...	26	...	...	...	...	...	...	...	...	7	31	24	27	...	...	...	...	...	...	1	31	...	...	...	...
...	3	...	3	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	21	26	15	24	15	22	...	...	...	...	...	...	...	...
...	2	...	...	...	...	...	...	...	7	...	...	...	13	...	...	...	...	...	...	...	...	...	...	16	28	18	20	...	...	...	...	...	...	16	24	...	...
...	8	...	12	...	...	...	...	...	...	...	...	...	22	...	...	...	...	...	...	...	...	...	...	15	21	16	29	1	26	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	28	28	...	...	...	...	...	...	...	...	...	...	...	...
...	5	...	4	...	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...	...	22	22	14	31	29	30	...	...	...	...	...	...	...	...
...	10	...	...	...	...	...	...	...	...	...	...	...	14	...	...	...	...	...	...	...	...	...	...	19	21	10	24	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	3	...	...	...	...	...	...	...	...	...	...	17	17	...	...	...	...	...	...	...	...	...	...	19	22
...	...	...	10	...	...	...	...	...	...	...	3	...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	8	...	...	...	...	...	...	5	24
...	...	...	1	...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	13	2	2	...	...	...	...	...	...
...	...	...	...	...	2	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16	30	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	24	...	...

Statement showing the Monthly Prevalence of Cholera

Name of District.	Names of Registration Circles, Talooks, Towns, Jails, Cantonments, &c.	Geographical position of Registration Circles (Talooks), Towns, &c. (Talooks relative to Districts and Towns relative to Talooks.)	Population according to last Census.	January.		February.		March.		April.		May.		June.	
				No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported	No. of Cases of Cholera reported.	No. of Deaths of Cholera reported.
Malabar.—(*Continued.*)	Ponnani, R. C. (Talook)	S. of District ...	310,131	...	3	...	3	...	4	...	2	...	...	...	1
	Ponnani, T.	W. of Talook ...	8,401	...	...	...	...	...	...	...	...	...	...	...	...
	Melmuri, T.	......	5,182	...	1	...	...	...	...	...	...	...	...	...	...
	Nettiga, T.	......	6,210	...	...	...	3	...	4	...	1	...	...	...	...
	Talakad, T.	......	5,522	...	...	...	...	...	...	...	...	...	...	...	...
	Vadanapalli, T.	......	6,670	...	...	...	...	...	...	...	...	...	...	...	...
	Kavasherry, T.	......	6,974	...	...	...	...	...	...	...	...	...	...	...	...
	Chillalancherry, T.	......	6,594	...	...	...	...	...	...	...	...	...	...	...	...
	Ponnandem, T.	......	5,394	...	...	...	...	...	...	...	...	...	...	...	...
	Atavanad, T.	......	7,129	..	...	...	...	...	...	...	...	...	...	...	...
	Kotacheree, T.	......	5,225	...	...	...	...	...	...	...	...	...	...	...	...
	Edappal, T.	......	5,113	...	...	...	...	...	...	...	...	...	...	...	...
	Eramungalum, T.	......	6,330	...	...	...	...	...	...	...	...	...	...	...	...
	Katikkad, T.	......	5,130	...	...	...	...	...	...	...	...	...	...	...	...
	Rayeramungalum, T.	......	8,984	...	...	...	...	...	...	...	...	...	...	...	...
	Yoruvayur, T.	......	5,460	...	...	...	...	...	...	...	...	...	...	...	...
	Ponnyur, T.	......	6,152	...	...	...	...	...	...	...	...	...	...	...	...
	Nattika, T.	......	6,210	...	...	...	...	...	...	...	...	...	...	...	...
	Etuttirutti, T.	......	5,991	...	...	...	...	...	...	...	...	...	...	...	...
	Zemindaries	......	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total District ...	......	1,849,805	...	8	...	7	...	31	...	35	...	77	...	199
	Total Madras Presidency ...	......	...	...	6363	...	2743	...	1887	...	2091	...	4442	...	8566

NOTE.—In this tabular statement the whole mortality from cholera occurring in a talook (Registration Circle) is shown under the talook return, but to show how the towns of 5,000 inhabitants and upwards have been affected by the epidemic, the particulars of each town have been separately entered below the Registration Circles, in which the town as well as village mortality has been included.—(W.R.C.)

in the Madras Presidency during the year 1870.

July. No. of Cases of Cholera reported.	July. No. of Deaths of Cholera reported.	August. No. of Cases of Cholera reported.	August. No. of Deaths of Cholera reported.	September. No. of Cases of Cholera reported.	September. No. of Deaths of Cholera reported.	October. No. of Cases of Cholera reported.	October. No. of Deaths of Cholera reported.	November. No. of Cases of Cholera reported.	November. No. of Deaths of Cholera reported.	December. No. of Cases of Cholera reported.	December. No. of Deaths of Cholera reported.	Total. No. of Cases of Cholera reported.	Total. No. of Deaths of Cholera reported.
...	27	...	116	...	48	...	57	...	57	...	261	...	579
...	...	...	...	...	...	...	...	...	8	...	8	...	16
...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	8
...	4	...	16	...	3	...	...	...	...	...	...	...	23
..	2	...	...	...	7	...	...	...	...	...	5	...	14
...	7	...	...	...	...	...	...	...	...	...	1	...	8
...	1	...	...	...	...	...	...	...	3	..	2	...	6
...	...	...	2	...	...	...	...	...	...	...	...	...	2
...	...	...	12	...	...	...	...	...	...	...	...	...	12
...	...	...	15	...	...	...	3	...	7	...	...	...	25
...	...	...	4	...	...	...	2	...	...	...	...	...	6
...	...	...	2	...	...	...	...	...	1	...	8	...	11
...	...	...	1	...	...	...	...	...	11	...	116	...	128
...	...	...	...	...	1	...	...	...	...	...	...	...	1
...	...	...	...	...	6	...	...	...	...	...	...	...	6
...	...	...	...	...	...	.	...	...	7	...	28	...	35
...	...	...	...	...	...	...	...	...	...	...	2	...	2
...	...	...	...	...	...	...	...	...	...	...	24	...	24
...	...	...	...	..	...	...	...	...	...	...	...	...	...
...	150	...	218	...	103	...	110	...	141	...	421	...	1,500
...	10305	...	9249	...	3630	...	2114	...	1702	...	2775	...	55,867

January. Date of first case.	January. Date of last case.	February. Date of first case.	February. Date of last case.	March. Date of first case.	March. Date of last case.	April. Date of first case.	April. Date of last case.	May. Date of first case.	May. Date of last case.	June. Date of first case.	June. Date of last case.	July. Date of first case.	July. Date of last case.	August. Date of first case.	August. Date of last case.	September. Date of first case.	September. Date of last case.	October. Date of first case.	October. Date of last case.	November. Date of first case.	November. Date of last case.	December. Date of first case.	December. Date of last case.
16	18	16	16	4	23	8	16	...	...	20	20	8	29	1	31	1	25	2	31	2	30	1	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	29	2	29
16	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	16	27	4	23	8	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	21	28	1	21	5	18	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	8	11	...	...	13	25	...	...	...	...	1	12
...	...	...	...	...	...	...	...	...	...	...	...	7	30	...	...	...	...	...	...	18	18	...	...
...	...	...	...	...	...	...	...	...	...	...	...	18	18	...	...	...	...	...	...	19	21	11	13
...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	23	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	22	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	29	...	...	26	28	3	24	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	20	...	...	25	27	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4	...	...	...	...	29	29	6	29
...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	12	...	...	...	...	12	30	1	30
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27	30	8	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30	30
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	28
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

(Signed) W. R. CORNISH, F.R.C.S.,

Sanitary Commissioner for Madras.